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JOURNAL OF EDUCATIONAL RESEARCH

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JOURNAL *of* EDUCATIONAL RESEARCH

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ARE CHILDREN READING?

STELLA YOWELL
Western State College of Colorado

SOMETIME ago the *Bookman* announced prizes for the best children's essays on the topic, "My Book Friends at the Movies." The editors stated that the essays showed more versatility and intelligence on the part of the children than had been displayed in previous contests, and that Huckleberry Finn and Tom Sawyer were book characters mentioned in almost every paper, while Jo and Amy from *Little Women* were not far behind. The editors also stated that children were reading practically the same books that their mothers and fathers had read when they were children.

The report of this article in the course in children's literature at our college caused considerable discussion. Many of the students agreed with the editors that children were reading the same books that our parents had read; others thought that these books were receiving very little attention. It was finally decided that a survey of the books which children read when not influenced by teachers or parents would shed some light on the subject.

Questionnaires were made and sent to city and village librarians all over the country asking for a list of the ten most popular books in their juvenile sections. The results were gratifying, and the replies, in many cases, were based upon the actual votes of the children. City librarians in Colorado, Utah, New Mexico, Wyoming, California, Missouri, Nebraska, Tennessee, Idaho, Massachusetts, Arkansas, Rhode Island, Florida, and Connecticut sent in lists of the ten most called-for juvenile books.

A list was made from these data and from recognized book lists of fifty characters that appear in children's literature in the field of realism, mythology, history, and fancy. Only outstanding characters were selected, and it was thought the list did not contain names of persons who appeared in more than one book. Two names, however, were included in the list that appeared in more than one

book. In scoring the papers, Rebecca was considered right if either the Rebecca of the Bible or the Rebecca in *Ivanhoe* was mentioned, although Rebecca of Sunnybrook Farm was the intended character. Several papers identified Jupiter as, "The old servant found in Poe's *Gold Bug*," while the mythological character was the one chosen. The list of characters selected for the test was:

The Duchess	King Midas	Captain January
Hans and Gretel	Tom Sawyer	Deerslayer
Pinochio	Penelope	Pandora
Heidi	Sinbad	Gluck
Rebecca	Sir Galahad	Kit Carson
Ali Baba	Uncle Tom	The Three Musketeers
Buffalo Bill	Mrs. Wiggs	Jupiter
Dr. Do Little	Ichabod Crane	Jo and Amy
Friday	Aladdin	Atlas
Uncle Remus	Tiny Tim	Miles Standish
Ulysses	Don Quixote	Hiawatha
Huckleberry Finn	Captain Hook	Joan of Arc
Prince and Pauper	King Arthur	Minerva
Robin Hood	Venus	Rip Van Winkle
Peter Pan	Thor	Daniel Boone
William Tell	Penrod and Sam	Little John
	Pocahontas	

All the characters were selected from books usually read by children under high-school age, but it was decided to give the test to high-school students. We wish to see whether the books were read during the high-school period, if they had not been read prior to this time. The results obtained from freshman and senior classes did not show enough difference to justify the belief that children read these books during high school.

Some of the answers were clever, many humorous, and a few were pathetic. The child who said, "Sinbad was a very sinful man," evidently believed it better to have guessed and lost than not to have guessed at all. The replies will give the reader an idea of how the children responded to the test. In some cases it is easy to trace an analogy, in others there seems to be no connection whatsoever between the correct answer and the one given. Some of the incorrect answers are:

1. Ulysses was a general in the American Army.
2. Ichabod Crane had a wife who beat him up.
3. Tiny Tim was a boy about the size of a thumb.
4. The Duchess are people who came from Holland.
5. Minerva is the wife of Andy Gump.
6. Heidi was the evil side of Dr. Jekyl.
7. Friday was Robinson Crusoe's dog.
8. Atlas was a man who made maps.
9. Kit Carson is the man in *The Covered Wagon*.

10. Miles Standish was a Pilgrim who lost his girl; a lady's man; and a traitor in the American Revolution.
11. Aladdin was Enoch Arden's friend.
12. Joan of Arc built an arc and saved all the people from a flood.
13. Peter Pan is a rabbit; a movie star. (There is a Peter Rabbit, but all Peters are not rabbits.)
14. King Arthur was the author of many books; the first man to own a round table.

TABLE I

CORRECT ANSWERS IN GENERAL READING TEST

CLASS	NUMBER TAKING TEST	GIRLS' ANSWERS		BOYS' ANSWERS		GENERAL AVERAGE
		Number Correct	Average Percent Correct	Number Correct	Average Percent Correct	
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Freshman	171	94	45.4	77	42.4	45.4
Sophomore	171	121	53.9	50	46.8	50.2
Junior	174	95	53.7	79	54.2	54.7
Senior	148	83	58.5	65	56.9	57.7
Total	664	393	52.9	271	49.0	51.2

The following correct answers show thought:

1. Mrs. Wiggs was a poor, optimistic woman who owned a goat, a cabbage field, and a large family.
2. Robinson Crusoe found Friday a true helper.
3. It would have been well if our soldiers in the late war (like Ulysses) had had but one vulnerable spot and that as obscure as the heel.
4. It would be diverting to change places with a prince as the pauper did.
5. Robin Hood led a gay life with his trusty and merry men in Sherwood Forest.
6. We may be glad we are not gifted with a golden touch when we read the story of King Midas.
7. Tom Sawyer was a dreadful worry to poor Aunt Sally.
8. Sailors are all more or less interesting but Sinbad is probably the most interesting.
9. Mrs. Wiggs named her children most unusual names but they seemed happy in spite of the fact.
10. Don Quixote was most disgusting in his burlesque of knighthood.
11. We would have been free from troubles had not Pandora's curiosity made her open the box.
12. Atlas had a great responsibility on his shoulders in the shape of the world.

The general average of 51.2 percent for 664 boys and girls is pitifully low. The results would indicate that the average child is not reading so much as he should read. The number and percent giving correct answers from a total of 664 pupils who took the test are shown in Table I.

The disappearance of the old-fashioned home where children and parents read aloud to each other, the lure of the motion-picture theater, and the coming of the automobile are partially responsible for such low scores. There seems to be too much competition for the leisure time of children, and reading, as a form of entertainment, is not popular. Means for interesting children in reading do exist, however. Personal ownership of books helps a great deal. A child should be encouraged, from the time he begins to read anything, to keep a record of the books he reads. Giving a child a book plate, allowing him to label his own books, permitting him to have a library—if only a shelf in the bookcase—and, above all, exhibiting some friendly interest in what he has read will provide a great impetus. Anniversary and holiday gifts should include a good book for girls and boys, but its selection should not be left to the clerk in the book store! Choose a book for a child as carefully as you would a pair of shoes, considering his tastes, needs, and experiences, for,

> A book's a magic sort of thing
> It makes you ruler, prince or king.
> When I am grown and own a shelf
> I think I'll have a book myself.

A STUDY OF RAPID ACCELERATION IN THE ELEMENTARY SCHOOL

HARRY E. ELDER
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MUCH has been written in the past decade in regard to the acceleration of pupils in the elementary school. A great deal of the acceleration in the school systems of the smaller communities has been accomplished by the skip-grade or double-promotion method. Even though this method has been used by many, little has been done to determine the actual results of such acceleration. The present study[1] is an attempt to supply this need.

The data used as a basis were the teachers' marks of 22 pupils of the elementary school of Monticello, Indiana, and the corresponding marks of all the pupils of all the groups to which these pupils belonged. Each of the pupils had been accelerated by being taken from a grade and placed in the next higher grade, thereby skipping one full grade of school work. Before acceleration these pupils were scattered through ten groups of children and after acceleration they belonged to ten other groups. The groups ranged in size from 14 to 70 so that a total of 696 pupils was involved in the investigation. By making comparisons of the standings of each of the 22 accelerated pupils in from three to five subjects, before and after skipping a grade, it was necessary to use 3,211 averages of teachers' marks or more than 10,000 monthly grades. In this manner 101 subject standings before double promotion and 101 corresponding subject standings after double promotion were secured for comparison.

In order to compare the standings already referred to, it was desirable to express each in standard units of measure. This was done by expressing each in standard-deviation or sigma (σ) units derived from the arithmetic means of the teachers' marks of each group in each subject. There are 101 such standings before double

[1] The writer has not reported this study because of its scope or because he believes in the absolute accuracy of the findings. On the other hand, he knows that the number of cases is too small to warrant an undue amount of confidence in the results. It does seem, however, that the method used is worthy of further study and application by other workers in the educational field. A more detailed report of this study will be found in the writer's Master's thesis "A Study of Rapid Acceleration in the Elementary School" (1925) which is on file at the University of Chicago Library.

promotion and an equal number after promotion.[2] The average of the standings before acceleration was slightly more than 1 σ (1.007 σ) above the means of the groups to which the 22 pupils belonged and after acceleration this average (.582 σ) stood .425 σ lower. This does not signify, however, a mere downward shift of this amount by the entire group. Those who stood low in their

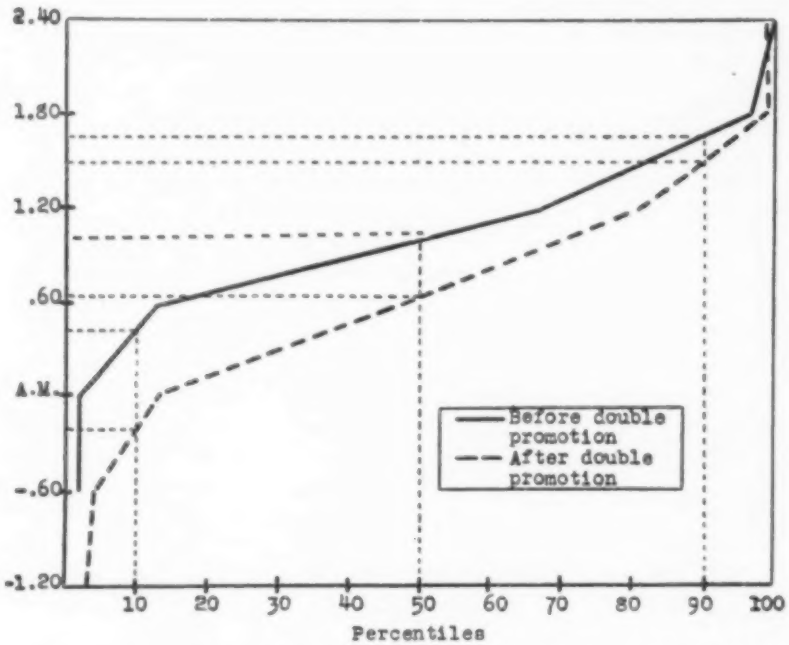

Figure 1. Standard Deviations from the Arithmetic Mean below Which a Given Percent of the Standings Lie

group before double promotion tended to suffer a greater reaction due to skipping. As evidence of this fact, we may point out that the brightest group (90-percentile) shifted downward .14 σ, the

[2] Each mark of each of the 22 advanced pupils was expressed in standard deviations from the means of the group to which he belonged. Standings before double promotion were derived by use of the formula

$$\frac{X - M_x}{\sigma_x};$$

those after advancement, by $\frac{Y - M_y}{\sigma_y}$.

average group (50-percentile) lowered .38 σ, and the dullest group (10-percentile) was displaced downward by .69 σ. Thus, if one were to represent the standings before and after acceleration by two ogive curves drawn from the same origin and combined into a single diagram, the parts of the curves representing the higher percentiles would nearly coincide, while the parts representing the lower percentiles would be far apart. This is shown in Figure 1. The points at which the dotted lines intersect the lines representing the standings before double promotion and after double promotion show the 10-, 50-, and 90-percentiles.

Another significant fact which the reader may have inferred from the preceding paragraph is that there is a greater dispersion of the 22 pupils after acceleration as far as their relation to the means of their groups is concerned. The standard deviation of the group before acceleration is only .493, the corresponding measure of dispersion after acceleration is .704, making a difference of .211. The accelerated group is, therefore, less homogeneous when the standings of its members are considered in relation to the means of the new groups. This is another way of showing that all accelerated pupils fare neither equally well nor equally ill.

The correlation between the standings before double promotion and the standings after double promotion, as determined by the product-moment method, is $0.42 \pm .05$. While 0.42 is not a high correlation, it is more than eight times the probable error, and is, therefore, reliable.[3] Since there is a decided correlation between the standing of a pupil before and after acceleration, it is possible to predict within a certain degree of accuracy, how a pupil will rank in his class after skipping a grade, provided that we know his standing in standard-deviation units from the mean before skipping.

The application of certain formula[4] will give predicted standings. From the large table containing the 101 predicted standings

[3] The correlation ratio of x' on y' is $.53 \pm .05$ and of y' on x' is $.52 \pm .05$. Since there is such a difference between the correlation coefficient and the correlation ratios, one is at first inclined to question the linearity of the regression. However, application of Blakeman's test shows that the regression is of the straight-line type.

[4] We may assume that X represents the standing of an individual before acceleration and that $\overline{Y}$ represents the standing after advancement. If we assume that X is one standard deviation above the arithmetic mean, we may find $\overline{Y}$ by substituting values mentioned above in the following prediction formula:

$$\overline{Y} = r\frac{\sigma_{y'}}{\sigma_{x'}}X + (M_{y'} - r\frac{\sigma_{y'}}{\sigma_{x'}}M_{x'}) \pm .6745\,\sigma_{y'}\sqrt{1-r^2}$$
$$= .58 \pm .40.$$

each fifth was taken. These are assembled in Table I. By a study of this table the reader may judge from the sampling with what degree of accuracy these predictions were made. Of the total 101 predicted standings, 40 were higher than the actual standings after double promotion while 61 were lower.[5] These facts show in a general manner the validity of the procedure.

TABLE I

PUPILS' STANDINGS IN STANDARD DEVIATION UNITS FROM THE ARITHMETIC MEAN

Subject	Before Double Promotion	After Double Promotion	As Predicted from Standing before Double Promotion
(1)	(2)	(3)	(4)
Reading	1.39	.31	.81
Reading	1.20	1.18	.70
Reading	.63	.42	.38
Reading	1.39	1.37	.81
Reading	1.70	1.30	1.00
Penmanship	.36	−.58	.19
Penmanship	1.32	.79	.77
Penmanship	1.37	.14	.80
Penmanship	.29	.12	.15
Penmanship	.88	.27	.63
Geography or history	1.03	1.30	.60
Geography or history	1.30	−.22	.76
Geography or history	.91	.42	.52
Arithmetic	1.72	.26	1.01
Arithmetic	.81	1.45	.46
Arithmetic	.88	.25	.51
Arithmetic	−1.17	−1.30	−1.02
Arithmetic	1.50	1.25	.88
Spelling	.66	.93	.37
Spelling	1.09	.88	.63
Spelling	.97	−.19	.56
Spelling	.83	.20	.48

Additional evidence is easily obtained to support the thesis that predictions of this nature may be made with a relatively high degree of accuracy. A comparison of the mean of the actual standings and that of the predicted standings shows the size of our mean

[5] Sixty of the predictions are within .5 σ of the corresponding actual standing; only two of the remaining 41 cases are more than 1 σ in error.

error of prediction in this particular study. The former mean is .582 σ while the latter is .561 σ, giving a mean error for the 101 predictions of only one-fiftieth sigma (.02 σ). Also, the correlation coefficient indicating the relation between the actual and the predicted standings is 0.49. While this coefficient is not considered high, it denotes a marked correlation and is higher than that existing between the actual standings before and after double promotion.

Other findings as a result of this study are of interest to the practical school administrator. One of these is that pupils did not seem to skip different grades with the same ease. While the preceding discussion has given results determined from a consideration of the group of 22 pupils as a whole, a more detailed analysis showed that the greatest decline in standing was suffered from skipping the second grade and the least from skipping the fifth.

Again, the relative decline in the various subjects changed as we progressed through the grades. The order of such decline, from least to greatest, according to this study was: (1) In the primary grades the least decline was in arithmetic, followed by reading, penmanship, and spelling, in the order named. (2) In the intermediate grades this order became spelling, penmanship, arithmetic, geography, and reading. (3) In the grammar grades the corresponding sequence was penmanship, spelling, reading, and history. A third point of interest to the practical administrator is that there was no appreciable difference in the effects of double promotion upon boys and girls, in spite of the fact that girls mature more rapidly than boys.

THE BEST-ANSWER EXERCISE AS A TEACHING DEVICE

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THE multiple-choice or best-answer form of test predominates in both standardized and informal tests of achievement in most high-school subjects. The predominance of this form is due in part to the fact that it combines definiteness and scope which are the distinctive features of true-false and the essay forms of tests. The true-false test restricts the pupil's thinking to a choice between alternatives and is therefore entirely definite. The essay test imposes no restrictions whatever, within the limits of the topic, and accordingly affords large scope for the pupil's responses. The best-answer test, while restricting the pupil's thinking to a central issue, allows him the choice of several possibilities. Thus it is a device well suited to the stimulation and direction of individual thinking.

In view of these facts it is somewhat surprising that best-answer forms have not been used more extensively as teaching devices. For the sake of emphasizing their value, this article contains illustrations of best-answer exercises that have proved useful in various high-school subjects. The illustrations are followed by suggestions for the guidance of teachers in constructing similar exercises for personal use.

Like any other mechanical device, the best-answer exercise is open to abuse; it can easily be made too definite and so become the end instead of the means of the pupil's thinking. The exercise directs thinking by restricting the considerations which apply to a given situation. There is consequently the danger that these restrictions may go too far and serve to isolate the given situation from other situations in the course; as when, for example, one learns to demonstrate successive theorems in geometry without recognizing their common elements. This danger may be somewhat minimized by constructing exercises which involve the situations treated in previous exercises.

When the exercises are substituted for the conventional classroom discussion, their value is somewhat conspicuous. When any high-school staff is asked to state its more serious teaching problems, a majority of the problems are likely to demand the sort of pupil direction which the best-answer exercise provides. The well-constructed exercise makes perfectly clear to each member of a class

the sort of conclusions he is expected to reach. It presents and analyzes a situation from which the pupil must select whatever will best help him to reach the conclusions. Each pupil is thus able to work at his own best rate toward a conclusion which the teacher deems important for the class as a whole, and the teacher is free to work with individual pupils who are having difficulties. This procedure is clearly superior to the recitation which undertakes to carry a class of mixed abilities through the same process of thinking at the same rate.

This type of exercise is recommended only as a means of teaching high-school pupils to think, that is, to analyze problems. It is sometimes useful as a form of drill, but the best-answer test is seldom useful in the teaching of appreciations. When properly constructed, such an exercise is a useful means of bringing the pupil's thinking to a focus, for in general class discussion there is often much waste because pupils are thinking in different, and sometimes useless, directions. The exercise should contain enough work to keep all pupils busy but allow them to work at different rates. The teacher is thus free to assist those pupils who need to be shown how to overcome individual difficulties. No matter how appropriate the content of a given course or unit may be, it is the teacher's function to make the contact between the subject-matter and the pupils' experience. The exercise may help to supply this point of contact for all pupils at once.

A typical exercise of the sort here considered is composed of four main elements: a self-explanatory problem-situation, a list of possible solutions or elements of the problem, a statement of what the pupil is to do with these solutions or elements in order to work out the desired conclusion, and a statement of what the pupil is to do in order to show that his conclusion is satisfactory. The best-answer tests may be prepared in advance of the class meeting, but they can seldom be standardized. They must usually be constructed for a particular class at a particular time. Those of larger scope may be used repeatedly. These exercises are not necessarily of restricted scope; they may be applied to a whole unit, to a week's assignment, to a given principle, or to some minor point which the class needs to think through.

Where it is convenient to group pupils according to their difficulties in a given unit of work, the members of each group may profitably work together on the exercise. While the exercise should usually be written in order that each pupil may work at his own

best rate, the comparison of conclusions serves to stimulate intelligent class discussion. It is not essential that the teacher read the papers after class. The exercise has served its purpose when the pupil's thinking has been directed to the desired end, and when he has arrived at an intelligent attitude concerning the principles set forth in the exercise.

Specimen exercises on typical high-school subjects follow. These exercises are analyzed at the close for the purpose of emphasizing the structural elements most appropriate to each subject.

ENGLISH LITERATURE

If the teacher of a tenth-grade class wishes to stimulate interest in the psychological implications of the play, *Macbeth*, and also of various significant passages, the implications must be presented in such a way as to challenge the least literary pupils to think toward the same end as the brighter pupils and to progress as far as they can in the time available. For this purpose an exercise like the following is appropriate:

Answer the following questions in order with the aid of the text:

1. Taken as a whole, is the play true to life as you know it? Yes..... No.....
2. Check all of the following statements which could be used to support your reply to the question above:
   a. There are no such things as ghosts and witches in real life.
   b. The ghosts and witches in the play merely represent the guilty conscience of Macbeth and do not affect the other characters.
   c. A friend of the king like Macbeth would have more to gain by letting Duncan live than by killing him.
   d. When a small act of dishonesty succeeds very well it is likely to encourage a man to become more and more dishonest.
   e. A delicate and sensitive woman like Lady Macbeth would not be likely to dare her husband to prove his love by committing murder.
   f. Weak women are often more ambitious than more self-reliant women.
   g. Many sensitive women can steel themselves to desperate acts, but after committing the act their nervous energy leaves them and they become pitifully weak.
   h. If she had been wicked enough to drive her husband to murder Duncan, Lady Macbeth would not have weakened sooner than Macbeth himself.
3. Copy the letters corresponding to the above sentences which you have checked and write numbers after each one referring to the pages and lines of the text which tend to show that the statement is true.

The following exercise differs in purpose from the above, for it seeks to relate the material read to the pupils' life experiences.

1. *Pilgrim's Progress* is an allegory. In it different situations that arise represent certain experiences that people go through. Bunyan had in mind for the most part religious experiences, but this allegory can represent many experiences that are not particularly religious in their nature. Here are four parts of *Pilgrim's Progress* numbered from 1 to 4:

   1. The Slough of Despond
   2. The Chained Lions
   3. Vanity Fair
   4. Doubting Castle

   Here are six incidents in everyday life, with a blank space in front of each. Four of these can be taken as illustrations of the four parts of *Pilgrim's Progress* just mentioned. Each one of these four incidents illustrates one and only one of the four parts listed. The other two incidents do not illustrate any of the four. In the blank space in front of the incidents put the number of the part of *Pilgrim's Progress* which you think it illustrates.

   .....A rather dull pupil has by hard work raised her grade from a low D to a high C.

   .....A man in the University of Iowa has a book three-fourths finished, but has done no work on it for a year because he had decided that it is not worth completing, although all of his friends have assured him that it is excellent.

   .....A girl in the University of Iowa who could easily win the highest honors in scholarship is getting Incompletes and Conditions because of the time taken up by social life.

   .....A boy who might make a real athletic success has decided not to try because there is one part of the work which has "got his goat."

   .....A pupil who is not especially brilliant has won the liking and respect of his teachers and fellow pupils by his good manners and his cheerful ways.

   .....A pupil who has neglected his work for the first half of the semester is in doubt whether it is worth while for him to try since the neglected work will handicap him.[1]

SOCIAL SCIENCE

The next exercise, taken from American history, is to be worked in class with the aid of all available references. Its purpose is to explain and emphasize the historical origins of political parties.

How do political parties originate?

1. Make a list of the national parties which have elected at least one president to office.

---

[1] By M. F. Carpenter, University High School, Iowa City; quoted by G. M. Ruch in his book, *The Improvement of the Written Examination*, (New York, Scott, Foresman and Company, 1925), pp. 82 ff.

2. To which of the following possible causes may the organization of these parties be traced? Check the causes you consider significant; then number them in order of decreasing importance.
   a. The election of Washington in 1789.
   b. The need for efficiency in administration of the national government.
   c. The differences in governmental policies advocated by different geographical sections.
   d. The issue between capital and labor legislation.
   e. The tariff question.
   f. The unselfish desire to elect the best qualified candidate.
   g. The election of John Adams as president.
   h. The transfer of English parties to American politics.
3. Make a list of the most important planks in the platform of each of the parties you have listed in (1) at the time the party was first organized.
4. Check those planks which you consider important in the platform of some one national party at the last presidential election. Indicate to which party the plank belongs.
5. State briefly at least one reason for the present unimportance of the planks you did not check in (4).[2]

The exercise just given is an attempt to emphasize the meaning of facts which must usually be learned as such. The following exercise is intended to teach interpretation of the material studied.

Did the South really gain or lose by the Civil War, in the long run?

1. State in connection with each of the following topics what you consider to be the most *favorable* effect upon the South in the period from 1865 to 1898. Then state what you consider the most *unfavorable* effect.
   a. The political reconstruction of the southern states.
   b. Economic and social transition of the North in the sixties.
   c. The rise of the trust problem.
   d. Federal regulation of big business—to 1922.
   e. Civil service reform.
   f. The tariff problem—to 1922.
   g. The currency problem—to 1922.
   h. The labor problem—to 1922.
   i. Political policies and struggles.
   j. Foreign affairs.
2. Check in connection with each of the above topics those effects which you believe to have been directly due to the war. State briefly such facts as may tend to prove that these were effects of the war.
3. Do the favorable effects tend to counterbalance the unfavorable effects? Yes..... No.....
4. If you replied "yes" to the third question, try to suggest some political measure which might have tended to produce each of the favorable effects without the war.

[2] By courtesy of M. Raun, University of Chicago.

5. If you replied "no" to question 3, suggest political measures by which each of these unfavorable effects might have been remedied after the war.

The Van Wagenen American History Scales[3] illustrate the use of the best-answer exercise for the interpretation of historical characters. Each exercise presents a paragraph describing some significant action on the part of a given character. The paragraph is followed by ten statements, each of which suggests a different motive for the action. From these the pupil selects the probable motives.

SCIENCE

The best-answer exercise in science courses may be used either with laboratory demonstration or without it. When there is no demonstration, the same sort of exercise may be used as has been illustrated in terms of social science. The instructor presents a problem and lists a variety of solutions involving scientific principles, the pupil decides which solutions are the most efficient by checking them off, and then supports his decision by applying the principles studied or by working out his own principles with the aid of the text material, for example:

An egg is placed in a glass of water with a small piece of shell removed from the bottom of the egg. From the top of the egg a tube extends into the air the other end of which has been sealed to the egg so tightly that no air can enter. If this apparatus is allowed to stand over night, some liquid will have arisen in the tube.

Check such of the statements below as you consider reasonable:

1. The rising of the liquid in the tube was caused by air pressure on the water surrounding the egg.
2. The liquid in the tube is the albumen of the egg.
3. The liquid that you see is the water from the glass.
4. The liquid is a mixture of water and albumen.
5. The albumen of the egg passed through the membrane of the egg into the water of the glass and the water of the glass into the albumen as well.
6. The water of the glass passed through the membrane into the albumen. There was no reverse movement.
7. A less dense substance tends to move toward a more dense substance.
8. A more dense substance tends to move toward a less dense substance.
9. If the substance in the glass had been albumen and that inside the egg, water, the movement would have been: (a) the opposite, (b) the same.

[3] Published by the Bureau of Publications, Teachers College, Columbia University.

10. The same process takes place in the human body when we assimilate our food. The substance in the cells of the body is: (a) More dense than the food which it seeps up..... (b) Less dense than the food which it seeps up.....[4]

This type of exercise in science can be improved by the use of diagrams to illustrate the application of the various principles studied, as found in the Ruch-Popenoe General Science Tests.[5] When followed by a list of possible explanations for the phenomena shown in the diagram, these furnish excellent opportunity for individual thinking. The decisions reached may be verified either by experiment or by reference to text materials.

FORMAL SUBJECTS

When applied to formal subjects, such as mathematics, languages, and practical arts, the best-answer exercise is less useful only in so far as thinking is subordinated to drill. At some stage in the study of any unit in these subjects, there is occasion for the class to think out the implications of the principle to be applied.

The Problem Analysis Test by P. R. Stevenson will serve as a typical illustration from the field of mathematics. While designed for test purposes, the form is one which teachers of mathematics may readily apply to any problem as a means of directing the individual pupil's thinking. The following item is quoted:

The Valley Dale Development Company bought 180 acres of land adjacent to a city for $54,000. They divided it into 200 lots of equal value which they sold for $500 each. What did each of the 200 lots cost the company?

A. Which of the following facts are given in the problem?
   1. The cost of each lot.
   2. The selling price of the whole tract.
   3. The number of lots.
   4. The profit made by the company.

B. Which of the following things are you asked to find out in the problem?
   1. The cost of each lot.
   2. The number of acres in the land purchased.
   3. The selling price of each lot.
   4. The cost of the whole tract.

C. Which of the following is the most reasonable answer?

1.	2.	3.	4.
$180.00	$270.00	$360.00	$500.00

[4] By courtesy of A. Hahn, University of Chicago.

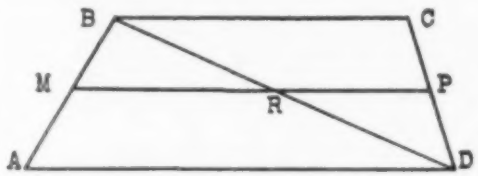
[5] Published by the World Book Company.

D. Check all of the following operations which are involved:
Addition Subtraction Multiplication Division[6]

Such an analysis is often made more concrete by confining the list of "things to be found" in B to the steps which the pupil must actually take in solving the given problem and then requiring the pupils to number these in the order in which the values must be found to solve the problem.

Exercises of similar sorts apply equally well to most of the units in algebra. In factoring, for example, the pupil may be asked to identify the case involved in a given expression, to check that one of various groupings of the terms which fits the case designated, and then to factor the expression by applying the formula which governs the case. The various numerical factors of the first and third terms of a trinomial may be listed in parallel columns, thereby reducing the pupil's task to the matching of the two sets of factors which give the middle term. The analysis may be carried further when necessary in presenting any new type of problem so that the pupil is not required to do any computation. He has merely to follow through the application of the principle.

In geometry, the exercise will usually be based on a figure from which the pupil is to determine certain relationships. These relationships may, or may not, be those which are covered by theorems previously studied.



Given:
$AM = MB$
$MP \parallel AD$

A. Which of the following can you prove?
1. $MP \parallel BC$.
2. $CP = PD$.
3. $MP = \frac{1}{2}(AD - BC)$.
4. $\angle MRB = \angle BDA$.

B. Which of the following will help you prove your choice in A?
1. $MP \parallel AD$.
2. $BC \parallel AD$.
3. $BR = RD$.
4. $MR = \frac{1}{2} AD$; $RP = \frac{1}{2} BC$.

C. Which of the following axioms, theorems, and corollaries would you use to prove your choice in A?
1. If a straight line is parallel to one side of a triangle and bisects another side, it bisects the third side.

[6] Form 1, Grades VII to IX, Problem VI. Published by Public School Publishing Company.

engine. The quotation omits the first five sections of the exercise

2. If equals are added to equals the sums are equal.
3. If a straight line is parallel to one of two parallels, it is parallel to the other also.
4. If two parallel straight lines are cut by a transversal, the corresponding angles are equal.

D. Which of the following axioms, theorems, and corollaries would you use to prove your choice in B?

1. The line joining the midpoints of two sides of a triangle is parallel to the third side and equal to one-half of it.
2. If a straight line is parallel to one side of a triangle and bisects another side, it bisects the third side also.
3. If a straight line is parallel to one of two parallels it is parallel to the other also.
4. A trapezoid is a quadrilateral with two sides parallel.

E. Fill the blank parentheses below with the numbers of the corresponding items checked in B, C, and D just given:

(A) (1) (B) ( ) (C) ( ) (D) ( )
(A) (2) (B) ( ) (C) ( ) (D) ( )
(A) (3) (B) ( ) (C) ( ) (D) ( )
(A) (4) (B) ( ) (C) ( ) (D) ( )[1]

FOREIGN LANGUAGE

Most recent texts in foreign language are abundantly supplied with drill exercises. The best-answer exercise is perhaps less useful here than in other subjects, because it is an inefficient means of drill. There is the further reason that both translation and composition in the foreign language constitute thinking exercises of the very best type, provided that pupils are not required to think at the same rate of speed. There is little advantage in the use of formal exercises. In the translation of passages in which the thought is involved, exercises patterned after the best-answer reading tests may at times be useful and can be readily constructed for any given passage.

PRACTICAL ARTS

Shop courses, home economics, and art work can use the best-answer exercise to good advantage whenever emphasis is to be placed upon the comprehension of principles rather than mere dexterity. The following exercise is taken from a machine-shop course and applies to the unit devoted to the single-cylinder two-cycle gas

[1] By courtesy of D. F. Brightbill, Belleview High School, Belleview, Pa.

engine. The quotation omits the first five sections of the exercise which contain directions for taking down the machine, studying the materials, and reassembling it.

VI. Can you start the engine? If the engine fails to start, check the reason in the following:

1. Poor compression.
2. Cylinder flooded with gasoline.
3. No gasoline in the carburetor.
4. Spark not timed properly.
5. Contact maker out of adjustment.
6. No spark at spark plug.
7. Spark-plug gap too wide or not wide enough.
8. Ignition not timed properly.
9. Water in gasoline line.
10. Carburetor adjustment not right.
11. Improper valve timing.

VII. The following remedies may be applied to the defects you have checked. Check those remedies you consider most efficient as applied to the defect checked above.

1. Adjust spark plug points to proper gap.
2. The valves should be properly timed in relation to the piston position.
3. Leaky piston rings should be replaced.
4. Carefully check wiring with spark plug on top of cylinder so that spark may be observed in its relation to piston position.
5. Scored cylinders should be reground.
6. Careful observation of cam and contact maker.
7. Valves should be ground until they become leakproof.
8. Choke in carburetor should be closed only long enough to get the engine started.
9. Spark should always be turned on when engine is cranked.
10. Gasoline line should be clean and free from obstructions.[1]

The section of this exercise which follows those just given presents a list of principles which explain why certain of the remedies just mentioned are better than others for the particular defects. The pupil is directed to number the principles to correspond with the remedies which the principle best explains.

The same sort of exercise may be applied without much modification to units in home economics. The pupil is required to select from a list of processes those which are most efficient for the purpose specified and then to select those principles which explain the efficiency of the processes selected.

[1] By courtesy of H. M. Buerckholtz, University of Chicago.

Similar exercises in the field of art may be constructed by the use of diagrams and sketches. For example, a course in interior decoration will present the sketch of a room in which certain pieces

TABLE I

ELEMENTS OF THE BEST-ANSWER EXERCISE IN DIFFERENT SUBJECTS

Subject	Problem Situation	Analysis	Selection or Interpretation	Generalization or Proof
(1)	(2)	(3)	(4)	(5)
English literature	A broad, significant question requiring understanding and application of text.	A list of possible interpretations of the text or selected passages.	Directions to check plausible interpretations from list.	Directions to cite specific references which justify the interpretations checked.
Social science	The description of a complex social situation involving a given principle or policy.	A list of the social implications of the situation.	Directions to check the implications that are most important or most pertinent to the given principle.	Directions to test this selection by readings or to outline means of improving the situation.
Science	The description of an experiment involving a given scientific principle.	A list of possible explanations for the results of the experiment described.	Directions to check the explanations that are scientifically valid.	Directions to cite scientific principles which support the explanations checked.
Language	A list of expressions involving the same rule of grammar, syntax, or rhetoric.	Directions to state a rule to explain the similarity of these expressions.	A list of other expressions, some involving the rule and others not. Pupils check those involving the rule.	Directions to test adequacy of rules derived by comparison with rule found in text.
Mathematics	An algebraic or geometrical problem to be solved.	A list of the elements of the given problem.	Directions to organize these elements according to some formula or plan.	Directions to solve the problem or prove the conclusion.
Home economics	The description of a situation in home management which is unsatisfactory.	A list of both desirable and undesirable conditions in this situation.	Directions to check the undesirable conditions.	Directions to state or check remedies for the conditions checked by applying certain rules.
Shop	The description of a problem requiring use of machine tools.	A list of the operations required to do the job.	Directions to check the correct methods of performing these operations from a list of methods.	Directions to justify the methods selected by reference to trade or scientific principles.

of furniture are to be arranged so as to conform to the principles studied. Various different arrangements may be proposed from which the pupil selects the most artistic and then justifies his selection by checking the appropriate principle.

SUMMARY

In Table I an attempt is made to indicate the structure of the best-answer exercise as applied to units in the subjects already mentioned. The substance of this discussion of the best-answer exercise may be summed up in the statement that the exercise helps to solve those problems of high-school teaching which are due to the difficulty of directing individual thinking. The next step toward the adoption of a more adequate teaching procedure is taken when pupils are taught to construct their own exercises. This may be accomplished in the sense that pupils can learn to organize the data of a given unit so as to reach conclusions of their own. The best-answer exercise may thus be used to teach those methods of organizing data which are most appropriate to the given subject. Such exercises are useful in working from the group recitation procedure to a more adequate procedure of directed study.

VARIABILITY OF WORD-DIFFICULTY IN FIVE AMERICAN HISTORY TEXTS

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TEACHERS of American history in the seventh grade have told me that pupils have difficulty in reading and understanding certain textbooks in the subject. In order to determine the variability of word-difficulty in the textbooks used in the schools under my supervision, five of the history books were subjected to a word-count. For convenience these books were designated A, B, C, D, and E,[1] and each will be referred to hereafter by letter and not by title.

The words on every fifth page in each of the five books were counted until a total of forty-five pages had been selected. In each case a full page was chosen, thus avoiding much variability in the number of words checked. About eighty thousand running words were gathered by this method of sampling.

These words were first checked against Thorndike's list of the most common English words. There are one hundred and thirty-five words in this list of which the first five are *a, about, after, again, against.*[2] The words included within this list of most common words were eliminated from the group to be considered in this study, for they were well within the knowledge of any seventh-grade pupil.

WORDS FOUND IN THORNDIKE'S WORD BOOK

The words which remained were next compared with the lists given in the Thorndike *Word Book.*[3] A record was made of the number of times each word appeared within the sampling, and

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[1] The textbooks used were: Book A, *The History of the American People* by Beard and Bagley (1924 ed. New York, Macmillan Company); Book B, *History of the United States* by Bourne and Benton (1921 ed. New York, D. C. Heath and Company); Book C, *History of the United States,* by Gordy (1922 ed. New York, Charles Scribner's Sons); Book D, *Our United States, a History* by Guitteau (1919 ed. New York, Silver Burdette and Company); Book E, *Leading Facts of American History,* by Montgomery (1920 ed. Boston, Ginn and Company).

[2] This list is found in an article by E. L. Thorndike entitled "Word Knowledge in Elementary School," *Teachers College Record,* 23:239, September, 1921.

[3] Thorndike, E. L. *The Teacher's Word Book.* New York, Teachers College, Columbia University, 1921. 134 pp.

each word was classified according to the designations given in the Thorndike list. The words found within the first five thousand most common words were also eliminated from this study, because Dr. Thorndike, when interviewed on the matter, was of the opinion that the words within this group were entirely familiar to seventh-grade pupils. Table I gives the general summary of the words included within this investigation which were found in the second five thousand words of the *Word Book*. The table may be explained as follows: Book A had 19 words in the 5,145 to 5,544 group, while Book D had 25 words in the same group. The figures listed under each of the textbooks summarize the facts for the respective texts. The coefficient of dispersion for each book was computed by

TABLE I

GENERAL SUMMARY OF WORDS FOUND IN HISTORY TEXTS USING THORNDIKE'S KEY

Credit Number	Position of Words in Thorndike List	Textbooks				
		A	B	C	D	E
(1)	(2)	(3)	(4)	(5)	(6)	(7)
9	5,145 to 5,544	19	19	16	25	19
8	5,545 to 6,047	21	19	21	32	26
7	6,048 to 6,618	21	14	17	33	23
6	6,619 to 7,262	36	24	21	23	22
5	7,263 to 8,145	32	17	24	38	40
4	8,146 to 9,190	22	16	13	28	17
3	9,191 to 10,000	16	10	18	23	16
Outside the 10,000 group		68	64	48	95	36

dividing the arithmetic mean into the standard deviation. These two measures were obtained, using the data given in Table I.

The coefficients of dispersion for the five books are given in Table II. It is true that if several groups have been measured by the same scale and the central tendency or mean has been determined, the one will be considered most homogeneous or unified which has the smallest deviation. The mean difficulty of Book B is the lowest, while that of Book E is the highest; the advantage is not large for it is the difference between 6.25 and 5.94, or .31 points. The variety of word-difficulty is greatest in Book D when judged in standard-deviation units, while that of C is the lowest, a difference of .20. The least variability, as expressed by the coefficient of dispersion, is shown by Book C and the greatest by Book D.

WORDS NOT FOUND IN THE WORD BOOK

The words listed in Table I under the caption "Outside the 10,000 group," that is, words which were not found in the Thorndike *Word Book* were next considered. Lists of these words were arranged alphabetically for each text, and the frequency of the appearance of each within the sampling used in this study was recorded. Within the forty-five pages checked in Book A, 68 words were found which were not among Thorndike's ten thousand commonest words, 64 words in Book B, 48 in Book C, 95 in Book D, and 36 in Book E.

Since no credit number was assigned to the words not found in the Thorndike *Word Book*, it seemed desirable to determine whether each word was (1) of general usefulness for the seventh grade,

TABLE II

COEFFICIENTS OF DISPERSION FOR EACH BOOK

Books	Arithmetic Mean	Standard Deviation	Coefficient-Dispersion
(1)	(2)	(3)	(4)
A.....	5.98	1.79	.299
B.....	6.25	1.88	.300
C.....	6.02	1.71	.284
D.....	6.04	1.91	.316
E.....	5.94	1.84	.308

(2) of probable usefulness for the study of history in the seventh grade, or (3) of doubtful service in the seventh grade. In order to determine these facts a list of these words was submitted to six representative and competent judges, who were asked to mark each one according to the following key: *G* if the word seemed of general usefulness for the seventh grade; *H* if it was probably useful for the study of history in the seventh grade; and with an interrogation mark (?) if it was of doubtful service in the seventh grade. An additional direction was mentioned: "Mark each sheet without comparison with the others. It may happen that the same word marked '*G*' on one sheet is marked with a '?' on another. This indicates a close decision." The scheme of recording the ratings given by the six judges to five of these non-Thorndike words is shown in Table III. The complete table of the ratings made by the judges for the unusual words in each of the five history books

was used to find an "index of the uselessness" of the words in each book. This index of uselessness of the word was found by totaling the number of times the interrogation mark was found in the result of the rating by all judges for a certain text and by dividing this sum by the total number of words found in the text which were not in Thorndike's *Word Book*.

The index of uselessness of words as determined by the six judges is summarized in Table IV. From the table it appears that

TABLE III

CERTAIN RATINGS GIVEN BY THE JUDGES

WORD	JUDGES					
	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6
(1)	(2)	(3)	(4)	(5)	(6)	(7)
catechism...	?	G	?	?	?	G
demagogue..	?	?	?	?	?	H
courier.....	H	?	?	?	?	?
fabulous....	G	?	?	?	?	G
patroon.....	H	H	H	H	H	H

TABLE IV

THE INDEX OF USELESSNESS OF THE WORDS IN EACH HISTORY TEXTBOOK

History Texts	Words Not in Thorndike *Word Book*	Total Number of Words Rated	Index of Uselessness	Rank
(1)	(2)	(3)	(4)	(5)
A.....	68	89	130.88	3
B.....	64	73	114.06	4
C.....	48	67	139.58	2
D.....	95	149	156.84	1
E.....	36	35	97.2	5

Book A had 68 words not found in Thorndike's *Word Book*. The total number of times these words were rated as not belonging to the seventh grade, that is, with a "?," was 89. Dividing 89 by 68 equals 130.88 which is the index of uselessness of the non-Thorndike words found in Book A, and this index ranks third within the group of textbooks. Column *5, Rank,* shows that Book D had the highest index of uselessness of words contained according to the rating of the judges, Book E had the lowest, Book C ranked second, while Book B ranked fourth.

SUMMARY

The writer realizes that there are other factors than word-difficulty which must be considered in determining the difficulty of reading material. This study, however, is concerned only with the one element, word-difficulty. The evidence seems to show that the variability of word-difficulty in the five American history texts is not marked. Book D, however, does show the highest standard deviation and the highest coefficient of dispersion, and therefore may be pronounced the most variable and the most difficult. Book C has the lowest standard deviation and the lowest coefficient of dispersion, and therefore it may be pronounced the least variable and possibly the least difficult. The coefficients of dispersion in all the texts are about the same, there is, therefore, a remarkable uniformity in the word-difficulty in all of them.

Book D has the largest number of words not found in the ten thousand most common words of the Thorndike *Word Book*. The index of the uselessness of those words for the seventh grade, as rated by the judges is highest, which indicates that Book D is most difficult. Book C, which shows the least variability when judged by its standard deviation and coefficient of dispersion, is second lowest in the index of uselessness of words outside the ten thousand group, while Book E, which ranks third in standard deviation and fourth in coefficient of dispersion, has the lowest index of uselessness of words outside the ten thousand group.

THE INTEREST FACTOR AS RELATED TO METHODS OF INTRODUCING BEGINNERS TO WRITING

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BEGINNERS are commonly introduced to writing in one of two ways, either by the direct-learning method in which the child is presented with a model that he immediately attempts to copy, or the device method in which the child practices for a time with supplementary mechanical aids. The models for the first method may consist of outlines of simple objects which the child attempts to draw free-hand, followed by parts of letters, whole letters, and words. Several forms of mechanical devices which may be used are: furnishing the child with outlines of familiar objects such as a coffee-pot and milk bottle and requiring him to fill in the outlines with colored pencils; using sandpaper or emery outlines of letters or words which the child traces with his fingers; or having the beginner trace, with a pencil, grooved letters, or words. Another form is that in which the teacher grasps the child's hand and puts it through the writing movements, while still another form consists in giving the child a model copy over which he places a piece of transparent paper and attempts to trace the letter or word through the paper. The use of these and similar devices is based not only on the assumption that they have transfer value for the actual writing situation, but that they are interesting in themselves and relieve some of the monotony and unpleasantness of beginning handwriting.

A recent experimental study concerning the effectiveness of the direct-learning versus the device method of teaching beginners to write, found that the direct-learning method produced by far the superior results.[1] The present article, however, concerns itself with an analysis of the interest factor of these two methods observed in the experiment referred to. It must be mentioned that it was more difficult to analyze and state in quantitative terms the interest which the children manifested in the methods and devices they employed in learning to write than it was to measure the writing product itself. The experiment was planned primarily for the

[1] Hertzberg, O. E. *A Comparative Study of Different Methods Used in Teaching Beginners to Write.* New York, Teachers College, Columbia University, 1926. (Teachers College, Columbia University, Contributions to Education, No. 214)

purpose of comparing the effectiveness of the different methods in developing writing ability, but material was also obtained which was worthy of analysis from the standpoint of the interest factor.

The experiment, begun in November, 1925, employed for a fifteen-day period four different methods of teaching beginners to write, the first two of which were different mechanical devices; a third, direct learning; and the fourth, a combination of mechanical devices and direct learning. The subjects were 245 kindergarten children in three representative public schools of New York City. The pupils from each school were divided into four groups, each group using a different method. Kindergarten children were used because it was important to obtain results from children who had had no previous training in writing.

In Method I three forms of mechanical devices were used—groove tracing, sandpaper-outline tracing, and finger tracing of the model. For the first form, words were deeply enough indented in heavy pasteboard to enable the child to follow the groove easily with his pencil. Glue and fine sand were used, in the second form, to provide a raised outline of words, on heavy pasteboard, which the child could easily follow with his finger. For the third form, the child followed with his finger the model copy of the word printed in script. Because finger tracing and sandpaper-outline tracing are similar, both were used on the same day's practice period, while groove tracing was used alone every other day for the entire period. These three forms all correspond to each other, for they exercise primarily the kinaesthetic sense, but do not permit the child to create anything of his own.

Method II made use of but one form of the mechanical devices—that of tracing the model copy, with a pencil, through transparent paper. In Method III, the direct-learning method, the children were supplied with model copies of the words which they were to reproduce. The model was placed directly above the practice paper so that the child could get a direct view of it while attempting to copy. Under Method IV, a combination of the three procedures used by the other groups was employed in succession, for a period of five days each.

The words—*cut*, *run*, and *cat*—were printed in script on cards having dimensions of four and one-fourth inches by eleven inches, and supplied to all children, *cut* the first five days, *run* the second five days, and *cat* the third five days. Words were selected for use in this experiment because it was felt that the child could gain greater satisfaction by expressing himself in meaningful words than

in isolated letters. Furthermore, these particular words were selected because they included a minimum number of simple above-the-line letters which presented in general an onward movement and which could be easily executed in the devices.

Each of the groups was trained in only one of the four methods. Because the experimental subjects were kindergarten children, it was obvious that one could not rely upon their subjective statements as to the degree to which they were interested in the different methods. Furthermore, all groups except those employing Method IV used the same scheme throughout the fifteen-day period and were therefore able to show their interest in only one method.

The teachers, however, changed groups and methods at the end of every five days, thus making it possible for them to observe the degree to which the different methods aroused the interest of the children, and, at the same time, to eliminate the personality factor to a considerable degree. The criterion which was therefore selected was the estimate of the six teachers.

Interest record blanks were constructed and supplied to each of the teachers for the purpose of obtaining records on the waxing and waning interests, which the children manifested toward the methods used. Moreover, each teacher, to obtain her criticisms of the method which she had used, was interviewed by the writer at the end of each week.

In order that all the teachers would understand exactly what was required of them on these interest record blanks, instructions were given as follows:

> Observe during the week the interests of the children in the device or method with which they are working, and on the fifth day of the week make an estimate of the interests of the group as a whole on the following five-point scale: 1, very low; 2, low; 3, average; 4, high; and 5, very high. Do not permit any decided change in interest the latter part of the week to unduly influence your estimate of the interest for the week as a whole.

Table I gives a tabulation of the children's interest in the four methods as obtained from the teachers' interest record blanks. It is evident from the interest records shown here that the degrees of interest which the children manifested toward the four different methods shifted perceptibly during the three-weeks period. The averages for each week indicate that while the device methods were highly interesting to the children at the beginning of the experiment, they generally decreased in interest as the experiment progressed. The reverse situation is recorded for the group that used

the direct-learning method, in which the children, although manifesting only a fair degree of initial interest, became highly interested as the experiment proceeds. In an effort to explain what occasioned this reversal of degrees of interest between the device and direct-learning methods, it is necessary to note the reactions of the children, as reported by the teachers, toward each of the four methods.

Concerning Method I, the teachers were agreed that of the three devices used—groove tracing, sandpaper-outline tracing, and finger tracing—the children found groove tracing the most interesting. A reason for this preference was reported by one of the teachers

TABLE I

CHILDREN'S INTEREST IN THE FOUR METHODS

TEACHER	METHOD I			METHOD II			METHOD III			METHOD IV		
	Week 1	Week 2	Week 3	Week 1	Week 2	Week 3	Week 1	Week 2	Week 3	Week 1	Week 2	Week 3
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
A	....	4	....	5	....	4	....	4	....	5	....	4
B	5	....	3	....	5	....	3	....	4	....	5	....
C	....	4	....	4	....	4	....	4	....	5	....	3
D	5	....	3	....	5	....	3	....	5	....	4	....
E	....	5	....	4	....	3	....	3	....	5	....	3
F	5	....	2	....	4	....	3	....	5	....	5	....
Totals	15	13	8	13	14	11	9	11	14	15	14	10
Averages	5.0	4.33	2.66	4.33	4.66	3.66	3.0	3.66	4.66	5.0	4.66	3.33

who said, "The children prefer writing with a pencil to finger tracing. They enjoy the manipulation of the pencil because it produces a dark line which they can see." This preference conforms in general to Dr. Thorndike's theory of the "satisfyingness of manipulation," and his statement that "to do something, and have something happen as a consequence is. . . . instinctively satisfying."[2]

It was evident from the reports of all the teachers that the other two devices aroused less interest because the children could see no tangible results from their practices. The teachers further reported, however, that while the children enjoyed the groove tracing at the beginning of the experiment, partly because it was easy and

[2] *Educational Psychology.* New York, Teachers College, Columbia University, 1920. Vol. I, p. 142.

because they experienced considerable immediate success in execution, they soon tired of it. Several teachers reported that their children repeatedly asked when they could write on paper, and practice "real writing," as one child remarked. The teachers were of the opinion that these devices had no value, either as a means of introducing children to actual writing or as a means of arousing their interest in writing, unless the children were allowed to practice actual writing in the same period that the device was used.

Considerable difference of opinion was expressed by the teachers as to whether the group using Method II showed greater interest than the group that used Method I. The children who traced the model through transparent paper encountered more initial difficulty than those who did groove tracing because they were not mechanically guided to such a great extent. As a result, using the second method, they failed to trace the word as many times as the first group. Throughout the experiment, a close relationship was noted between the degree of success attained in executing a new situation and the degree of interest in that situation.

The majority of the children, however, did not find transparent paper tracing too difficult, and it was a surprise to see how well they were able to trace. Furthermore, the children in the transparent paper-tracing group had more happen as a result of their manipulations, and it was observed by the writer and the teachers that, as the experiment advanced, this group was the more interested. This device was one of real tracing—the children used both pencils and papers and were able at the end of the exercise to view with satisfaction the results of their efforts. The interest of this group did not decrease as much as did that of Group I, and it would seem, therefore, from a consideration of interest alone, that this method is superior to the first one.

It was interesting to note the changing attitude of the teachers toward Method III as the experiment advanced. During the first week, several teachers were frankly skeptical of the efficacy of this method because the children were having great difficulty in getting started. For the first few days, the children scribbled. They tried hard to copy the word but in the majority of instances, the outlines could not be interpreted as having the faintest resemblance to the model copy. The situation was novel, however, and the children displayed great effort although at first their lack of success quite naturally discouraged them and lowered their interest below that of the other groups.

The mechanical devices gave the children in the other groups a general idea of the proportions of the letters, where to start writing, the direction in which to proceed, and all in all, familiarized them with the written word. The direct-learning group, on the other hand, was forced to proceed entirely by trial and error—whatever "happened" was the result of the children's own initiative, effort, and perseverance. In this group, the children were required to get an idea of the model before them and then to translate this idea into an unaccustomed motor reaction, which called forth a distinctly creative effort. The noteworthy factor concerning the direct-learning group, however, is that, in spite of the initial obstacles and discouragements, the interest steadily increased as the children became more successful in executing the writing exercises. The device groups, as was stated before, showed a gradual decrease in interest as the experiment advanced.

The children who employed the fourth, or combination method, were, in general, interested throughout the three-weeks period. Each device was employed only for one school week and, therefore, not long enough to become monotonous. While the interest records of the teachers for this group indicate no heightening of interest the second week—when the children traced through transparent paper—it appeared to the writer that these children were generally quieter and more absorbed in tracing, with a pencil, on paper, than in the grooves or, with the fingers, on the sandpaper outlines. The interest of this group dropped perceptibly the third week when the direct-learning method was employed. Such a drop in interest was to have been expected, for these children faced for the first time, the confusion, obstacles, and the consequent discouragements which the direct-learning group experienced the first week of the experiment.

The results of this study on interests are significant when compared with the results obtained in the study, previously referred to in this article, on the effectiveness of the methods discussed here in developing writing ability. It was found that there is little or no transfer from the ability developed by the use of these mechanical devices to the situation which requires actual writing. The effects of training by the four different methods indicated that the children improved most when introduced to writing by means of the direct-learning method. The combination method was next in merit, with the transparent paper-tracing and groove-tracing methods showing no appreciable transfer value to actual writing.

The devices, therefore, as a means of developing writing ability were found to be inadequate, especially when they were compared with the direct-learning method. Moreover, the contention that the mechanical devices have merit because of the interests which they arouse is found also to be an unsatisfactory excuse for using them. The interest which they aroused was obviously not an interest in writing, but in the devices themselves. Furthermore, the fact that the interest in the devices noticeably decreased in this three-weeks period indicates that the interest factor of the devices themselves does not have intrinsic merit. As soon as the devices lost their novelty, they became more or less monotonous, and there was indication that had the experiment been continued for a longer period, the children would have lost interest in them altogether. Children, like adults, are not interested in the repetition of mechanical and, to them, meaningless, routine acts. They are interested, on the other hand, in attempting things, and will proceed by the trial and error method until something has been accomplished. Even the small child will obtain a high degree of satisfaction from random manipulation of the pencil and will scribble all over a paper. Direct his hand, however, and he is generally bored.

Although the direct-learning method in this experiment developed the highest ultimate interest, it does not necessarily follow that every child need encounter the obstacles and confusions in beginning writing which were experienced by these children. Perhaps words, or even letters, are too difficult for the young child to execute easily at the start. Preliminary exercises consisting of simple, meaningful outlines might be given to the child to copy free-hand. Even with such an approach, it is only natural that the child's manipulation of the pencil may not result in immediate success. What he will develop, however, is an independent and individual conception of doing the thing in the way it will later be required of him. The transfer to actual writing will be of perceptible value, and, if the outlines are simple and interesting, the child will experience satisfaction in his success, and will progress by direct learning to the more difficult outlines and finally to actual writing.

THE GIFTED CHILD

I. EDUCATIONAL CONCEPTS AND PRACTICES

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CHILDREN of unusual ability, who have at one time or another been called precocious, bright, superior, or super-normal, have been called "gifted" rather consistently since Whipple's use of the term in his monograph, *Classes for Gifted Children,* published in 1918. Terman, in his book *Mental and Physical Traits of a Thousand Gifted Children,* has recently restricted the term to the individuals within the upper one-half of one percent of the children of any given age, as graded by intelligence tests. The children considered in his study had I.Q.'s of 140 or more and fell within the group just mentioned. Since the report of this study includes the most extensive data available on the subject, it is obvious that his definition of the term "gifted" will have considerable influence on its future use. Most of the literature here summarized uses the term in a much less restricted sense, however. With different authors it has varied in usage, designating anywhere from the upper 1 percent to the upper 10 percent of the distribution of intelligence. Because of these variations in the use of the term, children with intelligence quotients as low as 115 in some instances, and in other instances only those above 135, have been classified as gifted.

One has only to go to the literature to see how concepts of giftedness have changed. We find mention of it in medical, sociological, psychological, educational, and even in popular writings. The attitudes of writers in all these fields have changed recently, chiefly because research is taking the place of theory. However, one can still find, in popular writings, concepts which most psychologists and educators have long since discarded.

The general public has long had faith in the so-called "principle of compensation." Accordingly, those who read rapidly are supposed to forget easily, those who are dull in school to make the greatest successes in life, while delinquents are often thought to be those who were bright but grew up in the wrong environment. Thorndike (86), Gates (87), Norseworthy (88), and others, however, have found a high correlation between speed and accuracy, on the one hand, and speed of learning and retention, on the other.

They have found that when bright children are given extra promotions because they are making excellent records, they continued to do so through high school and university (16, 17). Williams (66) and Tjaden (65) have shown that high intelligence quotients are less common among delinquents than among the population at large, the ratio being about 6.5 to 48.

The medical profession for some time believed that precocity, or early maturation, was pathological. Dorr (2) and Hollander (6) made such statements, and although Terman was led to the same opinion in his early study of bright children (12), he no longer holds this view (80). Binet's concept of a mental age which does not necessarily parallel chronological age, but which approximates a normal curve of distribution, has led to studies which show quite conclusively the non-pathological nature of precocity. Millard (8) finds that eminence is always accompanied by precocity, but precocity does not necessarily predict eminence.

The idea that insanity and genius are closely related has been the popular theory since the latter part of the nineteenth century, when Lombroso thought he had found such a relationship (7). Ellis, after a more recent study (3), said that between 5 and 6 percent of men of genius have been insane, but Hirsch (5) and Cox (69) point out that considerable prejudice characterized both of these studies, and that all the needful points were not taken into consideration in making these judgments. Hirsch says, "We are apt to call the uncommon irrational." The psychoanalysts have been especial offenders in this particular (3, 56). Dr. Cox's study of three hundred men and women of genius, and Terman's investigation of a thousand gifted children—children who have very few relatives who are or have been insane—show that the connection between insanity and genius is not nearly so close as has been supposed.

The public would like to believe with Ward (13), Odin, and other sociologists that environment produces genius. Wiggam stated the view of the biologist and the psychologist rather well, however, when he said, "Leaders come not by prayers but by germ cells" (14). Because Odin found many more eminent men in the cities of France than in the rural districts, he thought that the more favorable environment developed giftedness. Galton, in his *Hereditary Genius* and *English Men of Science;* Woods, with his study of royalty (84); Cattell's (68), and Brimhall's (67) studies of eminent men of science; Peters' findings in a study of marks in

German schools for three generations within certain families (78); Müller's study of identical twins who grew up apart (77); and many other recent investigations, not all of which have been published, show that eminent individuals tend to be related and that heredity plays a large part in determining intelligence. Terman has found in his extensive study of gifted children that they have many more eminent relatives than have children of the same ages selected at random.

From the idea that proper environment and training could produce prodigies came the accounts of the Sidis boy (9, 58, 66), the Stoner girl (10, 11, 61), and the Berle children (1). Martha, (64) the writer happens to know, has suffered no ill effects from having been taught to read when quite young (26 months); she has excellent health, has skipped several half-grades, and is getting along nicely in school. From among Dr. Terman's forty-one cases mentioned in *The Intelligence of School Children*, may be cited Martha's brother, who has received highest honors for all his college work so far. Another of this group completed his legal training at the age of nineteen and must wait until he is twenty-one to be eligible for admission to the bar. It may be mentioned that although he worked his way through university without help he made excellent grades. Another of these cases was graduated from university last year *cum laude*, several others are now in college, and many have distinguished themselves in one way or another.

To the popular contention that genius is one-sided, may be opposed the findings of Mitchell (59) and Scripture (60), which show that though an occasional person of unusual mathematical powers seems to have but little ability along other lines, the correlation of mathematical ability with general intelligence is high. DeVoss found that gifted children are relatively no more uneven in their abilities than are unselected children (80).

Terman's study of this large group of gifted children has likewise disproved the popular beliefs that the bright child is sickly and that the bright boy is a sissy, or that he is unsocial and not liked by other children. On the contrary, these one thousand gifted children are slightly above the average in anthropometric measurements, in health, in sociability and interests; the gifted boy is more masculine than are unselected boys of his age; and gifted children are more popular as playmates than are other children. One is tempted to agree with Wiggam that "popular sayings are always wrong" (14).

So long as there was no research regarding the true nature of giftedness, and since genius was regarded as pathological, educational practice was slightly, if at all, inclined to take cognizance of the gifted child. Not until Binet's mental tests had brought about an adequate concept of the extent of individual differences did educators begin to appreciate the problem of the bright child. School practice, as yet, has not been greatly modified by research regarding individual differences. Extra promotion is still, as it was several years ago, the school's most prevalent method of providing for gifted children.

About thirty years ago there were several plans of promotion in use, by which the bright pupils were given extra promotions without missing a whole year's work, while the average pupils progressed at a normal rate, and the dull ones were less retarded than by the annual-promotion scheme which had been in common practice since the advent of the graded school. Few of these schemes are now in use, partly because of changes in administrative personnel and partly because other methods have come into prominence. A modification of the Cambridge plan (44), however, is still in use in Beverley, Massachusetts. Dr. Cubberley's discussion of these promotional plans is a good brief summary (37), but longer discussions of the individual plans are also available (32, 49, 35, 50, 55, 47, 48, 37).

Perhaps in actual practice the plans just mentioned placed an undue emphasis on the retarded child, but, nevertheless, a form of homogeneous grouping was obtained thereby, which Varner's study seems to indicate was roughly homogeneous (81). As the testing movement grew and as educators became concerned with individual differences, which were found to be of greater extent than had previously been supposed, tests began to be used as the basis for homogeneous grouping. In many cities, children are now grouped in some or all grades according to one or more of the following criteria: group intelligence-test scores, intelligence quotients as determined by the individual Binet examination, scores on educational tests, teachers' judgments, and the principals' judgments (76).

The movement toward ability grouping may be said to have reached its highest point in the so-called "X-Y-Z classes." By this method, the bright children are placed in the X group, the average in the Y group, and the dull in the Z group. A much enriched course of study is presented to the X group, a somewhat restricted curriculum to the Y group, and only minimum essentials to the Z

group. Many school administrators feel that when this plan has been put into operation the problems arising because of individual differences have been solved.

The various plans of individual instruction are also enjoying quite a vogue. Such plans, advocated first by Search (46), and later by Burk (34) and Washburne (51), allow the child to progress according to his ability with little or no group instruction, and, in the words of their proponents, "break the lockstep of the annual promotion plan." Many public and private schools are using either the Dalton plan (45), the Winnetka plan (51, 53), or the San Francisco Normal School plan (33); and they feel that the schools are thereby being better adjusted to the capacities of pupils than by any other available plan. Because Washburne finds that some of the gifted children in the schools of Winnetka complete the work of the grades quite rapidly, he thinks it best to keep them in junior high school for a year or two after the completion of the regular work, that they may be more mature when they enter senior high school (52).

Various other plans have been used by certain school systems, such as attempts to solve the problems caused by individual differences among children. Elkhart, Indiana, uses a maximum-minimum assignment plan; weighted credit, according to the amount of work done, has been or is being used in some twenty-five cities (42); promotion by subject is frequently used in elementary schools; unassigned teachers sometimes work with bright as well as with dull pupils; and in some school systems children are allowed to earn extra promotions by means of work in summer school. A few colleges are using homogeneous grouping (26); Stephens College uses the quartile system similar to the maximum-minimum assignment plan of Elkhart; Hobart College (15) and Princeton (23) are using plans similar to the Stanford University independent-study plan, by which bright pupils who have made excellent records are allowed to pursue studies independently while still undergraduates.

Only in a general way do these schemes provide for the gifted child; extra promotions are apt to be rather grudgingly given, and ability grouping is often done with much more consideration for the dull than for the bright (36). Individual instruction has not that defect in theory, but usually tends in that direction in practice. The other plans mentioned are as yet fairly new and still in the experimental stage, for individual instruction is considered a fad by many educators. What school provision, then, is available

for the gifted child? Is there any plan which is free from these defects?

While developing the various systems of provision for deviates from the normal, many schools have experimented with special classes for several types of children, such as the feeble-minded for whom there was no room in institutions, delinquent children, the border-line cases who could not get along well in school, the blind, the partially blind, those with speech defects, the deaf, and the crippled. These types of unfortunate children are being taught in special classes and by special teachers in several cities throughout the country. Horn's recent study shows the extent of such provision (25).

Not until such special classes were well advanced, did the school authorities seem to have considered special classes for the gifted children. Unfortunate children demand attention, because they do not get along well in regular classes, and it is expensive to have them retarded and repeating instruction. Compulsory-attendance laws say they must attend school, and some form of special instruction is less expensive, in the long run, than is retardation. Bright children, however, unless inclined to be mischievous, are not apt to trouble the teacher. Moreover, what teacher wants to part with her star pupils? For such reasons, the schools, for the most part, have neglected them or given them only extra promotions.

The first argument advanced in favor of special instruction for the bright seems to have been that it would save money for the taxpayers to have these children spend less than the regular number of years in school (40). As schools have become more and more crowded, this has become an increasingly valid argument. Moreover, there have been some individuals who thought there was considerable economic waste in having these children spend eight years in the grades and four in high school. They have been in favor of "speeding up the bright children" (41). They used for this, first, extra promotions and later the so-called "speed classes" which covered the work of two years in one, of two semesters in one, or of three semesters in two.

Whipple supervised one of the first of these speed classes in Urbana, Illinois (28). In 1911 there were four cities in which there were special classes for the gifted (29); since then, accounts of special classes in some twenty-five or more cities have appeared. Questionnaire studies from time to time have shown varying numbers (70, 71, 72, 74, 75, 79, 82). Usually such classes have been

experimental—organized for the purpose of determining whether bright children are harmed by being segregated or given the same amount of work in less time than the regular class. Sometimes such classes have been formed for expediency when a change was being made in the school system. Among the early accounts of school provisions for the gifted, are the description of the special classes for the gifted in the high school at Long Beach, California (31); the report of the special class in St. Paul, Minnesota, which covered the work of one semester in one summer session (43); and the so-called "special class" at Richmond, Virginia, that was an opportunity room in which gifted children spent only enough time to make up work in order to skip a grade (54).

Recently there has been rather a strong tendency to give the child in the special class for the gifted a greatly enriched curriculum instead of helping him to finish school in much less than the usual time (18, 19, 20, 21, 22). This is probably due to many factors: the influence of the X classes with an enriched curriculum, the fact that there are still those who are unconvinced as to the practicability of the bright child's saving some time, and the belief that it might be safer for the bright child not to be greatly accelerated in school for his years and social development (24). Usually there has been a moderate amount of acceleration combined with the enrichment. Enrichment has not been a very valuable solution of the problem in some school systems, probably because it has meant a mere addition of more of the same kind of material to the curriculum (27). Bright children seldom need drill on a point in order to get it. Speed is one of the elements of brightness. But, when this concept has meant, as it has in some school systems, a change of curriculum with the aim of fitting the school to the child, much good has been accomplished. When foreign languages are added in the grades and special instruction in music and art is given, when there are many special educational trips, when research is encouraged, when bright children are urged and allowed to work up to their capacities and are considered as individuals and not merely as bright children, then we may say that a solution of the problems inherent in the instruction of the gifted child is in sight.

From a consideration of educational concepts and practices relating to the gifted child, one may conclude that while little has been done to solve the problems presented by individual differences among the gifted, there is a healthy attitude of experimentation in many school systems. Probably the most promising solu-

tion is ability grouping by which gifted children are placed in special classes which are much less restricted than the so-called "X sections." The best practice favors the use of many criteria in selecting children for these classes. Teachers' judgments, group intelligence and educational tests, school marks, and often individual tests unite in a composite judgment. The most progressive tendency is to remove many restrictions from the curriculum, and to enrich it with new and valuable material, instead of merely adding longer assignments in the traditional subjects. Individual differences among the bright are coming to be recognized as well as group differences (57). The fact that a child is bright is not conclusive evidence that he can profit most by the music, art, and foreign languages which have usually been added in special classes for the gifted. The tastes of the exceptionally gifted are enormously varied, and any school procedure to be of maximum value must make provision for these variations. In the evolution of thought and practice this advanced view seems the most reasonable, and in the light of past advancement, it seems quite likely that the aims will as far outstrip the practices in the future as they have in the past.

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[1] The references listed in this bibliography are but a sampling taken from a more extensive annotated bibliography which forms a part of the author's Master's thesis entitled "The Gifted Child and the Special Class." This unpublished thesis is on file in the Psychology Department at Ohio State University.

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ON COMPUTING THE AVERAGE DEVIATION FROM THE MEAN

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IN certain computations, notably those involving correlation and regression formulae, the only measure of variability which one uses is the standard deviation. In many other cases, however, the average deviation will do as well, but thus far the fate of a certain excellent formula for solving the average deviation has been to go practically unnoticed. By this formula, devised by Truman L. Kelley, the average deviation, which was formerly the hardest of all the measures of variability to reckon, becomes by far the easiest. In the procedure outlined within this article, the same manipulation yields the constants for computing both the mean and the average deviation, respectively a measure of central tendency and a measure of variability.

THE FORMULA

By a simple adaptation, Kelley's formula,[1]

$$\text{A.D.} = \frac{2}{N}\left(FM - \Sigma\, {}_1^F X\right)$$

can be used with such deviations as gross scores when classified in groups. When the formula is multiplied by the class interval, I, it becomes the formula for the average deviation, if steps (X''s) rather than the face-values of the classes, are used.[2] Kelley's formula translated into terms of steps, is then

$$\text{A.D.} = \frac{2 \cdot I \cdot F \cdot \Sigma X' - 2 \cdot I \cdot N \cdot \Sigma\, {}_1^F X'}{N^2} \quad \ldots\ldots (1)$$

The true mean,

$$M_X = \frac{\Sigma X' \cdot I}{N} + F_{0_X} \quad \ldots\ldots (2)$$

in which,

I = class interval,
N = number of cases, and
F = the sum of all frequencies *below* the average.[3]

[1] Kelley, T. L. *Statistical Methods.* New York, Macmillan Company, 1923. p. 72.

[2] In this case, of course, F and N have the same values as in Kelley's formula, the remaining two quantities ($\Sigma X'$ and $\Sigma\, {}_1^F X'$) being given in terms of steps (primed X's) instead of the original gross scores.

[3] An exact definition of "below the average" for this purpose is given in Operation 4 of the step-by-step operations described in this article.

$\frac{\Sigma X'}{N}$ = the sum of the X' times the frequency products divided by their number, and is consequently the mean, M', of the steps or transmuted scores,

$\Sigma_1^F X$ = the sum of the transmuted scores which *are below* the average,[4] and

F_{0_X} = face value of the zero-step.

AN EXAMPLE

The procedure can best be illustrated by a concrete example. In the distribution given in Table I, the measures have been grouped by two's; that is, $I = 2$. In such a distribution it will be noted that when we resort to grouping we implicitly assume that all measures have the face values of their respective classes. Consequently, the face value of the zero-step is $F_{0_X} = 2.5$. The operations performed in Table I are:

1. In column *3* write down the steps, X''s, beginning with the zero-step at the lowest class—here 2-3—and running upwards in ascending arithmetical order. Write a step at every class irrespective of whether the class has frequencies or not.

2. Obtain the entries of column *4*. Since a cumulation or addition upwards of these entries yields column *6*, column *4* has been inserted in Table I in order to show the extension of the frequencies by their respective steps. In case an adding machine is not available and long-hand methods must be resorted to, these products of column *4* may be found. With the adding machine this column is quite unnecessary and serves no useful purpose. The numbers in column *4* are the products of the respective second-column entries times the corresponding third-column entries given in the table.

Obtain the entries of columns *5*[5] and *6*. If an adding machine is available, and we shall assume there is one, it is not necessary to compute the numbers in column *4*. On an adding or a calculating machine depress the figure "1" in the extreme left-hand column of the keyboard, and depress 0, corresponding to $X' = 0$, in the extreme right-hand column of the machine. Now, with the "repeat" key depressed, crank the machine as many times as there

[4] These will be concretely visualized in Operation 4 of the detailed descriptions, given later.

[5] The cumulative frequencies, computed in column *5*, if recorded in full, are great aids in obtaining the cumulative percents for plotting an ogive.

are frequencies in column *2* opposite the zero-step—here, one time, since the zero-step has a frequency of 1. We are thus using the machine to add two columns simultaneously. Record the cumulative frequencies—here 1, shown in the left-hand half of the "total" window—in column *5* and the cumulative $\Sigma X'$—here 0, shown in the right-hand half of the "total" window in column *6*. Leaving depressed the "1" digit, frequency counter, in the left-hand column, depress the figure "1," corresponding to $X' = 1$, in the right-hand column and crank the machine as many times as there are frequencies in Step 1—here 3 times. Again record the cumulative frequency—here 4—and the cumulative X'—here 3. Continuing with Step 2 in the same manner, we secure the cumulative frequency—here 9—and cumulative X'—here 13—after Step 2; and then in like manner for all subsequent steps until, upon completing the cranking for the last step, the left-hand half of the "total" window will show the total number of cases, N, while the right-hand half will show the quantity $\Sigma X'$.

TABLE I

COMPUTATION OF THE AVERAGE DEVIATION FROM THE MEAN AND THE MEAN OF THE DISTRIBUTION

Classes	Frequency	X'	X'·Fr. = Col. *2*·Col. *3*	Cumulative Fr. = Cum. of Col. *2*	Cumulative X'·Fr. = Cum. of Col. *4*
(1)	(2)	(3)	(4)	(5)	(6)
12–13	1	5	5	20=N	50=ΣX′
10–11	2	4	8	(19)	(45)
8– 9	8	3	24	17	37 F
6– 7	5	2	10	9=F	13=Σ X′
4– 5	3	1	3	(4)	(3) 1
2– 3	1	0	0	(1)	(0)
Sums	20		50	Cumulated upwards	.....
Name of sums	*N*		ΣX′		

3. Determine M'. In Table I,

$$M' = \frac{\Sigma X'}{N} = \frac{50}{20} = 2.50$$

In terms of steps, the mean,

$$M' = 2.50$$

4. Obtain F and $\Sigma_1^F X'$ by the following computations: (1) Consider M' to be made up of $W + D$, in which W is the integral part to the left of the decimal point and D is the decimal part to the right of the decimal point. In the above example, W is 2, and D is .5. (2) F is now the cumulative frequency in column *5 inclusive of the frequency which occurs at the W-step.* In the above example, F is the cumulative frequency in the row of Step 2, and is 9. (3) $\Sigma_1^F X'$ is the corresponding cumulative X′· Fr. entry in column *6* of the W-step. In the above example $\Sigma_1^F X' = 13$. Both F and $\Sigma_1^F X'$ are marked in Table I.

5. When these quantities are inserted in the formula the average deviation may be computed:

$$\text{A.D.} = \frac{I\ F\ \Sigma X' \qquad I\ N\ \Sigma_1^F X'}{2\ (2)\ (9)\ (50) - 2\ (2)\ (20)\ (13)} = \frac{760}{\frac{(20)^2}{N}} = \frac{760}{400} = 1.90$$

If one has an extremely large distribution, involving many classes,[6] it should be observed that in order to determine F, and $\Sigma_1^F X'$, it is not necessary to record all of the possible cumulative scores as we have done. Merely those *very near* the mean—the numbers which are set in bold-face type in Table I—are all that are needed. It will be satisfactory to record three or four entries of each in the neighborhood of the inspectional mean omitting the entries of Table I which are within the parentheses. A quick inspection of the frequencies in column *2*, Table I, shows that the average will probably fall either in Step 2 or in Step 3. By rigorously adhering to the method of determining F, already given in Operation 4, there will be no difficulty in its determination. This is the only operation in which inexperienced persons are likely to fall into error.

6. The average, by substituting in formula (2) previously stated, is readily determined to be

$$M = \frac{\Sigma X' \quad I}{\frac{(50) \cdot (2)}{(20)}} + F_{0_X} \quad (2.5)$$
$$= 7.5.$$

[6] One should never group data unless at least twelve classes will result from the grouping. Only for sake of illustration, where printing space is limited, is the coarser grouping used in Table I of this article allowable.

This formula requires no interpolation and is practically foolproof. This determination of course depends upon knowing definitely the extreme lower limits of the zero-class. If 2 – 3 means 1.5000 – 3.4999, the face value, F_0, is 2.5.[7]

The principles derived in the computation of the example given in Table I have been embodied in a printed form sheet called a "Printed Average Deviation Form Sheet" which has the advantage of making automatic the steps involved and of providing a definite place for each necessary constant required in the equation.[8] A complete solution, using this form sheet, is shown in Figure 1.

Since an error in determination of F or $\Sigma {}^{F}_{1}X'$ may make an appreciable error in the average deviation, it is desirable to have a method of checking the correctness of one's work. This is accomplished by shifting origins and recomputing the average deviation. Described more concretely, a piece of cardboard or stiff piece of paper is laid just to the left of column B, and all the numbers except the zero of that column are copied on it. This cardboard we shall hereafter refer to as a stencil. Now place the stencil so that the 1 of the stencil coincides with the 0 of the chart, 2 of the stencil coincides with 1 of the chart, and so on.

Repeat Operation 2 on the adding machine, while thus replacing the steps of the sheet with the stencil steps. Record a few entries of cumulative frequencies and cumulative $\Sigma X''$ near the mean, and obtain again N and a sum of the products of stencil steps by the respective frequencies, which we shall call $\Sigma X''$. The check on the correctness of $\Sigma X'$ is that $\Sigma X''$ should be N larger than $\Sigma X'$. In the problem on the form sheet,

$$\Sigma X'' = 3839,\ M'' = 12.265,\ F'' = 157;\ \Sigma {}^{F}_{1}X'' = 1503.$$

Note that

$$\Sigma {}^{F}_{1}X'' = \Sigma {}^{F}_{1}X' + F.$$

Substituting these values in the formula for the average deviation,

$$\text{A.D.} = \frac{2 \times 2 \times 157 \times 3839 - 2 \times 2 \times 313 \times 1503}{(313)^2}$$

$$= \frac{529136}{97969}$$

$$= 5.401.$$

[7] It would be an extremely desirable convention if all persons dealing with statistical work would record at the time of tabulation just what are the two limits of the lowest class which they use in the classification, as has been done on the printed form sheet displayed in Figure 1.

[8] The printed form sheets, 8½ inches by 11 inches in size, may be obtained from the writer. Complete directions for use of the form sheet accompany the blanks.

is the coarser grouping used in Table I of this article allowable.

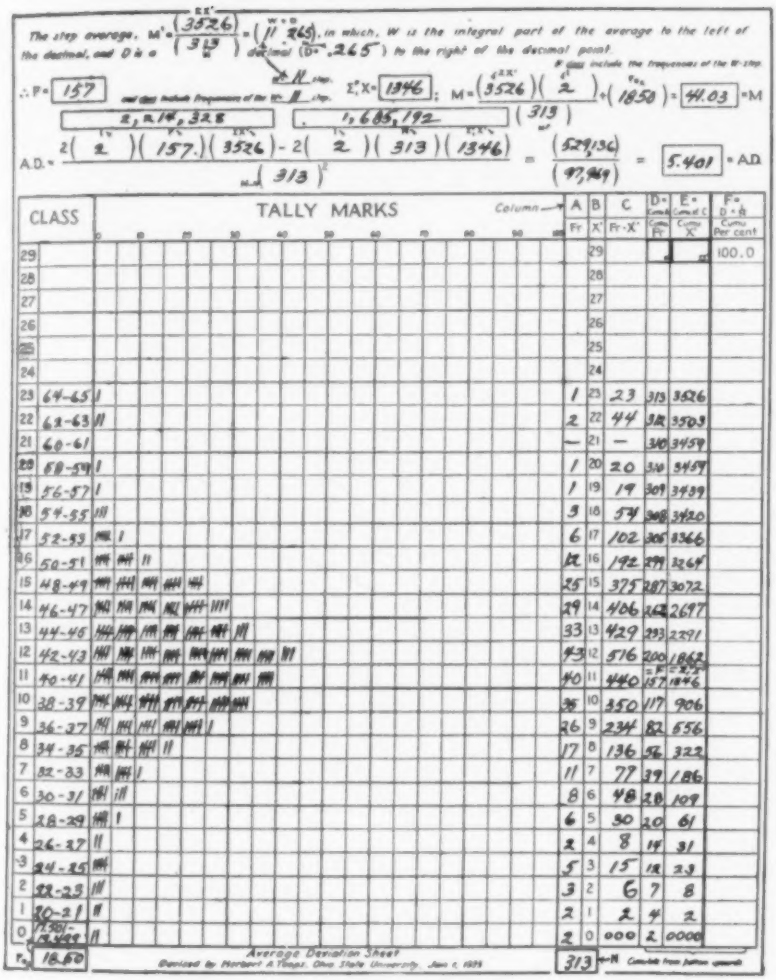
The step average, M' = (3526)/(313) = (11 + .265), in which, W is the integral part of the average to the left of the decimal, and D is a decimal (D = .265) to the right of the decimal point.
∴ P = 157
Σ'X = 1346
M = (3526)/(313) + (1850) = 41.03 = M
2,214,328
1,685,192
A.D. = 2(2)(157.)(3526) - 2(2)(313)(1346) / (313)² = (529,136)/(97,969) = 5.401 = A.D.
CLASS
TALLY MARKS
Average Deviation Sheet
Devised by Herbert A. Toops, Ohio State University, Jan. 1, 1926
313

Figure 1. Solution of an Average Deviation from the Mean, Using the Printed Form Sheet

There is absolutely no doubt as to the check, since the final simplification of numerator and denominator yields exactly the same integral quantities as in the example, Figure 1, of the printed form sheet.

The printed form sheets, 8½ inches by 11 inches in size, may be obtained from the writer. Complete directions for use of the form sheet accompany the blanks.

EDITORIALS

COMPETITIVE RESEARCH

The educational progress of the past quarter century has not been a mere matter of chance. It is rather the result of a new conception of the importance of education, as a field of service, fused with a realization of the possibilities of utilizing scientific methods in the solution of many of its vexing problems. The content of the course of study, prescribed by a bygone era and retained by modern social inertia, has been subjected to critical examination by research workers. Methods of teaching, frequently based upon what is now believed to be a faulty psychology, have been subjected to quantitative experimental appraisal. A knowledge of methods of determining the effectiveness of instruction by objective measuring devices has come to be considered a part of the teaching technique of every trained pedagogue.

Undoubtedly a large share of the credit for these modern shifts in educational thought and method, is due to the untiring efforts of the research worker—the doubter, the questioner. Yet in spite of the progress he has made, the research worker has often unwittingly reduced his own efficiency. While in the main he is a worker with the highest professional attitude, he rightly feels that the laborer is worthy of his hire and that he is therefore entitled to the professional rewards of the discoverer. Accordingly, he too often works alone, fearful that his secrets may be betrayed; and, as a result, there has been much duplication of effort. Research results doubtless need corroboration, but this is no reason for blind duplication.

Further progress, in the professional development of the field of education, will be founded upon sound and far-reaching programs of cooperative research rather than the present policy of competitive research. The right to protect the results of individual effort is not denied, but the importance of making available, to all persons in the professional field, the results which are of far-reaching professional significance must not be overlooked. Nor must the individual worker become so completely submerged in his own problems that he is totally unwilling to divert his energy and special abilities

sheet.

to projects of the larger type which can only be solved through cooperation. Many unsolved problems in school administration, supervision, and educational psychology remain unsolved because of the general failure of those in touch with the facts to recognize the problem, or because the research activities, of those who have most to gain from the investigation, are not coordinated. Much more educational progress may be expected in the future as the spirit of cooperation overcomes the present inertia due to lack of interest and the interference of competitive research.

H. A. G.

FRESHMEN

The crowding of ever-increasing numbers of students into our colleges and universities is attracting more and more attention. Institutions in which the Freshmen once were numbered by scores, now number them by hundreds, and where once there were hundreds, thousands must now be cared for. This has resulted in enlarged classes, to the irritation of the teachers and administrators, and in increased demands upon the budget. Many institutions have faced the situation by limiting the enrollment, either by setting an arbitrary number beyond which applicants are refused admission or by setting up scholarship barriers so high that only the approximate number desired can gain admission. Many state institutions find themselves forced by statute to accept practically all who can show high-school diplomas.

This condition has, of course, resulted in a large number of research investigations and tentative efforts toward the solution of the problem. Studies in various institutions have shown the number and proportion of Freshmen who fail their first quarter or semester, who are placed on probation, and who are eventually eliminated. These data have often been considered separately by colleges, by departments, by size of high school from which the student came, by subjects offered for entrance credit, by quality of work done in the secondary school, and by intelligence rating. There has been great freedom in examining the Freshmen, the preparatory work they have done, and the schools from which they were graduated. Apparently, much less attention has been given to the critical examination of the higher institutions into which these Freshmen come. Published data regarding the sizes of classes into which they are herded and the relation to failures, the training of instructors and the relation to failure, the experience of in-

that he is totally unwilling to divert his energy and special abilities

structors and failure, the required load these Freshmen must carry and failure, type of schedule judged by the class hours and study periods and failure—data regarding these and many kindred factors which doubtless affect the progress of the Freshmen are conspicuously absent.

Administrators need to be vitally concerned regarding the mortality of Freshmen. State institutions probably should not seek to limit enrollment or eliminate quickly on the assumption that what has been done in classrooms is of course the thing which should be done. Perhaps it is heresy to suggest that intensive studies should be made of college instructors, materials, and methods. Without doubt, many will declare it is an unwarranted attack on "the freedom of the teacher," but institutions of higher education exist for the student, not for the faculty, just as do the elementary and secondary schools. In these lower schools, we have had no hesitancy in submitting teachers, teaching materials, methods, and organization to the test of controlled experiment to determine efficiency in terms of pupil benefits. Is there any reason why the same should not be true in colleges? Is there any reason to believe that college teaching, whatever its objective, may not be improved by means of scientific experimentation? Must the laissez faire theory of administration continue with respect to *Lehrfreiheit* at the expense of thousands of Freshmen each year?

E. J. A.

into which they are herded and the relation to failures, the training of instructors and the relation to failure, the experience of in-

NEWS and COMMUNICATIONS

This department will contain news items regarding research workers and their activities. More formal communications on similar topics, preferably of not more than five hundred words, will be printed over the signatures of the authors. All correspondence concerning this department should be addressed to Dr. E. J. Ashbaugh, Ohio State University, Columbus, Ohio.

Charles C. Peters, professor of Education at Ohio Wesleyan University, holds a similar title at the University of Miami, Florida, where he is spending the current year.

Dr. C. C. Crawford, who for some time has been professor of Education at the University of Idaho, has accepted an appointment at the University of Southern California.

The educational leaders in the Philippine Islands have organized a campaign to wipe out illiteracy in five years. Why should not each state of the United States do likewise?

J. C. Stier, superintendent of schools in Washington, Pennsylvania, recently notified his teaching force, through his regular monthly bulletin, that the school board had requested the State Department to make a survey of the local schools.

Mr. E. L. Keezel of Whitman College, Walla Walla, Washington, has been made special secretary of the Chicago Principals' Club to succeed Don Rogers who resigned last spring to become principal of one of the elementary schools of the city.

A mimeographed bulletin entitled "Desk for Personal Helps in Social Science Teaching" has been started by the School of Education at the University of Kansas. The first number announced the purpose of the publication while the second issue gave a suggestive list of books in European and American history and civics.

Much newspaper publicity has been given to the educational experiment at the University of Wisconsin by which one hundred and twenty-five Freshmen and a small group of teachers will be offered complete academic freedom next year. Full details of the plan will be awaited with interest.

The New Jersey State Department of Public Instruction has begun an intensive study of the teacher-training problems of the state. Dr. G. C. Gamble, of Teachers College, Greeley, Colorado, has been secured as technical advisor. The formulation of a ten-year program is the goal desired as a result of the survey.

Dean W. L. Cross, of the Graduate School of Yale University, has announced the Sterling Fellowships for 1927-28. Candidates for Research or Senior Fellowships must have the Ph.D. Degree, or an equivalent amount of training and experience, while candidates for Junior Fellowships must be well advanced toward this degree. The stipends are liberal, and full information can be secured from the Dean.

Our High School Girls is the title of a bulletin published by the Milwaukee Board of School Directors, which presents, by a choice selection of illustrations and clear exposition, the types of work offered high-school girls in that city. It has evidently been prepared by a group which knows the modern girl of this age—her problems and her points of view.

The National Association of Secondary School Principals announced, in the October number of its bulletin, the next annual convention of that body for February 25, 26, and 27, in St. Louis, with headquarters at the Hotel Statler. The bulletin also contains reviews of seven books and brief comments, or annotations, on thirty-eight articles in recent magazines.

L. L. Caldwell, superintendent of the schools at Hammond, Indiana, has favored us with a set of his pupils' report cards for the elementary grades. These cards place emphasis upon the traits and habits which are desirable for good citizenship. When children find that the school is grading them on such points as industry, initiative, obedience, and self-control, they are likely to conceive that these characteristics are as important as achievement in arithmetic, history, and language.

The New Jersey State eighth-grade examinations for May and June were taken by approximately twenty thousand pupils. On the basis of the percent of pupils making above 70, history was the most difficult test—or found the students most poorly prepared. Some interesting variations appeared on individual questions. For example, although 95 percent knew that London is in England, only 76 percent knew that Newark is the largest city in New Jersey. Only 56 percent knew whether Daniel Webster believed in permanent union, nullification, or state's rights.

The Public-School Program, a bulletin of nearly a hundred pages published by the *Democrat and Chronicle*, a daily paper in Rochester, New York, is a reprint of a series of ninety-four articles which appeared in this paper from March 15 to July 1, 1926. Twenty-four of the articles deal with various phases of the elementary school; thirty-eight, with the junior high school; twenty-two, with the senior high school; and the remainder, with other phases of public education. The articles are organized under the general heads of "Aims," "Methods," and "Results."

American Education begins its thirtieth year with a change of editorial staff. Announcement was made in the final issue of last year of a change to the faculty of the School of Education of Boston University. The members

of the staff have no hesitancy in attaching their names to a "tentative platform of educational progress" which they submit to their readers. The platform reveals clear insight, wide interest, and a scientific viewpoint. An examination of the first number issued by the new staff indicates that the readers of this Journal will have no cause to regret the change.

Gil Dobie, football coach at Cornell University, is quoted as saying, "Football is utterly hopeless here. We can't pretend to meet our rivals on even terms. Other schools get football players, boys born and bred in the game, who come to the college with "prep-school" reputations. Here, all we have are students whose principal interests are in their academic and scientific courses. The courses are so tough they can't allow football to interfere. Those we get on the football field are not real athletes and never will be." Long live the institution where its primary function stands first! May Cornell be joined by a host of others!

The National Society of College Teachers of Education will hold its annual meeting in Dallas, Texas, on Monday and Tuesday of the week of the meetings of the Department of Superintendence, February 27 to March 3. President Walter S. Monroe announces that morning meetings will be for members only; that the meeting on Monday afternoon is to be devoted to a discussion of graduate work in research; and that the meeting the next afternoon will be a joint session with the Educational Research Association. Headquarters of the Society will be at Hotel Jefferson.

Dean L. A. Pechstein, of the College of Education, University of Cincinnati, announces a fundamental reorganization in the training work for teachers of small children in that institution. The Cincinnati Kindergarten Training School has withdrawn from the field, leaving the training of kindergarteners to the college. Work will be organized under the following members of the faculty: Pre-School, Dr. Ada Hart Arlitt; Kindergarten, Miss Grace Anna Fry; Reorganized Primary, Miss Francis Jenkins; Intermediate, Miss Harriet Z. Campbell. Dr. Ruth Streitz has been appointed a coordinator of the four fields, and committees are at work to determine the programs which will be offered.

W. J. Osburn, director of Educational Measurements in the Wisconsin State Department of Public Instruction, is the author of a mimeographed bulletin, *A Study of Children's Interests*. The bulletin was issued last spring but has probably not come to the attention of many who would be interested in its contents. The information was secured by each teacher making a list of the questions which the children asked from day to day, and by giving the children an interest test which involved such items as the games, magazines, and books they liked best; their avocations; and their use of money. Basketball was the preferred indoor game, and baseball the outdoor game. The *American Magazine* was first in the list of magazines read.

A series of investigations bearing upon the elementary-school principalship was projected at a meeting, on October 23, 1926, of a subcommittee of the Committee on Standards and Training for the Elementary-School Principalship. This group, a part of the Department of Elementary School Principals, met at the Headquarters of the National Education Association. W. T. Longshore, James F. Hosic, John L. Bracken, Edwin C. Broome, Mrs. Jessie M. Fink, George W. Frasier, Charles H. Judd, William W. Kemp, Worth McClure, J. Cayce Morrison, John K. Norton, Leonard Power, E. Ruth Pyrtle, and Ide G. Sargeant are members of the Committee. They are anxious to have information on all investigations which have been completed, or are now in progress, in school systems, colleges, universities, and elsewhere, that concern the status, duties, administrative relationships, and any other phases of the office of elementary-school principal.

The Inglis lecture of 1926, entitled "Opportunity and Accomplishment in Secondary Education," delivered by Paul H. Hanus, is now available in a pleasing library edition at the Harvard University Press. In developing his subject, the lecturer first of all traced the influence of certain more or less well-known organizations upon secondary education in the United States. These organizations are the New England Association of Colleges and Secondary Schools, the Committee of Ten, the Committee on College Entrance Requirements, the North Central Association, the College Entrance Examination Board, and the Commission on the Reorganization of Secondary Education. Having thus created a background for the further discussion of his subject, Professor Hanus stated that the most vital need in our secondary schools is the need of a militant attitude in favor of scholarship.

"Therefore," said he, "if teachers with superior accomplishments—productive scholarship—were assigned to pupils with manifestly superior capacity, a permanent, scholarly attitude, and habits in conformity therewith, should follow as a matter of course. But how to make this opportunity for scholarship more general offers a perennial challenge."

H. C. Koch

University of Nebraska

Our National Education Association President, Francis G. Blair, expresses the feelings of the executive committee—and doubtless of the members at large of the Association—in a letter which he sent to the secretary of the Washington Association, following the dismissal of President Suzzalo from the University of that state. The letter said in part:

"The National Education Association cannot sit by and see one of its honored members, an outstanding leader in education throughout the country, made the victim of political intrigue, and the growth of a great university obstructed. I, also, protest against the summary and unwarranted action of Governor Hartley's personally selected trustees, and hereby offer our services to your Association and to all other organizations within the State of Washington, which are working to save that state and the nation from an educational calamity and to return Dr. Suzzallo to the presidency of the University.

"Cases like these in Kansas and Washington involve the integrity of the entire teaching profession. America prides herself in keeping education free from partisan considerations—tenure, in reward for faithful service, being one of the planks in the platform of the National Education Association to which the entire profession is committed. It lies at the very foundation of efficient teaching service. We believe that the people of Washington will demand the reinstatement of President Suzzallo, whose services to Washington and to the nation have been notable."

We have recently received from E. C. Witham, director of the Department of Research, Wilmington, Delaware, a grade and progress sheet to be used in September and February. The sheet is divided into half-grades along the horizontal axis and half-years in school on the vertical axis. Its significant feature is the interpretation of a various number of years, rapid or slow, which are printed on diagonal lines on the face of the sheet. Following are direct quotations: "One and one-half years rapid, near genius—in rich curriculum; one year rapid, very bright—danger of wasting time on fundamentals; one-half year, slow—double promotion whenever possible; one year slow, danger line—individual instruction; one and one-half years slow—drill on fundamentals; two years slow—vocational try-outs; two and one-half years slow—border line cases; three years slow—ungraded classes; three and one-half years slow—probably feeble-minded." Mr. Witham says "The big thing about this chart, as I see it, is that it starts the teachers to doing something about the 'failures' or 'repeaters' or 'over-age' pupils under their care. They know without the chart that they have retarded pupils but they are complacent about it. After making up one of these charts the teacher wants to do something about their retardations right away." Any device which removes a teacher's complacency is probably of value. The first stimulation, it seems to me, should be toward ascertaining causes rather than immediate classification. Doubtless such an effect may be secured with this sheet and a moderate degree of supervision.

A SCIENTIFIC MEASUREMENT SCALE FROM INDIA

From India comes a significant indication that the movement for scientific measurement of education is spreading. This is in the form of a scale for measuring Bengali handwriting in primary schools, which was devised by the faculty of the Teachers Training College at Dacca, India, located "midway between the River Ganges and the Meghna River in Bengal." The aims of the scale are clearly set forth as: (1) to make a judgment which would remain unaltered on successive occasions, (2) to express one's judgment in a form exactly intelligible to all persons who are acquainted with the scale, (3) to add and divide judgments and so obtain average measurements of groups or classes, (for the intervals or sub-units in the scale are of equal size).

The reproduction of a section of the scale, given in Figure 1, will perhaps not make the expression of judgment intelligible to the readers of this Journal.

It might be, however, that a person who could not read the writing could discover some of the characteristics, which cause a specimen to be judged as good or bad, better than could one who understands the writing. It seems possible to consider the hieroglyphics purely as to form, abstracted from the meaning. Such an examination will make clear, for example, that regularity is one of the characteristics of merit. This has already been noted in connection with our measurement of the writing of English. A more detailed scrutiny might perhaps also reveal other purely formal characteristics.

F. N. FREEMAN

The University of Chicago

FOREIGN-LANGUAGE TRAINING OF TWO HUNDRED AND SIXTY-FOUR COLLEGE FRESHMEN

A study of the foreign-language training of college Freshmen was undertaken at the Oklahoma College for Women to find out when and what foreign languages had been studied by the Freshmen. Oklahoma College, a standard four-year state college, is a member of the North Central Association of Colleges and Secondary Schools and has planned its curriculum to resemble those of the more conservative colleges of liberal arts. Sixteen units are required for entrance, two of which must be in foreign language. Ten semester hours in one foreign language are required in either the freshman or sophomore years and students who present no foreign language for entrance are required to take two years of foreign language in college.

Of the 360 Freshmen enrolled, 264 were studying foreign languages. The distribution of these students in the various language courses and the language training which they had had in high school was as follows:

1. Of the 115 students who had two years of Latin in high school only 8 elected Latin in college.
2. Of the 42 students who had two years of Spanish in high school only 3 elected Spanish.
3. Of the 10 with two years of French in high school none elected French.

An examination of the time in the high-school course when the language was studied presents some interesting data. One hundred and fifteen of the students had only two years of Latin in high school, and 88 took these two years in the ninth and tenth grades. The 16 students of the 42 who had taken two years of Spanish in high school had it during the same grades. Only 10 students had taken two years of French in high school, and 6 of them also had it in the ninth and tenth grades as did the one student who took high-school German. In other words, of the 168 students who were enrolled in foreign-language classes for only two years during their high-school course, 111 had taken this work in the first half of the course. They were, consequently, two years removed from their language study when they entered the college. The college gives full credit for beginning work in a new language but not for a repetition of any of the first year's work in a language for which they pre-

sented entrance credit, which is undoubtedly a strong influence for the shift from one language to another between high school and college.

If these conditions are similar to those found in other higher institutions —and there is no reason to think that they are greatly different—it would seem that the high schools might well adjust their curriculum so that the two years of foreign language would be offered in the last two years of the course and that the colleges might adjust their courses so as to coordinate the instruction offered with the work done in the high school.

HOWARD TAYLOR

Oklahoma College, Chickasha, Oklahoma

AMERICA LEARNS FROM DENMARK

Denmark is on the road to fame—leaders of physical education in United States and Europe are looking to Denmark for something new. Last June, fifty physical directors from the colleges of America attended the Gymnastic Folk School at Ollerup, Denmark. Niels Bukh, himself, the founder of the new Danish gymnastics, taught them the fascinations of this informal type of gymnastics.

During the summer, almost a hundred more physical educators, gathered together from the four corners of our country, studied at a mid-west university, under a most charming little Danish woman—a graduate of Bukh's school and a former student at two other prominent universities of Denmark and Finland. When the University of Iowa issued 1926 summer-session bulletins announcing the presence of Karoline Nielson as a teacher of Danish gymnastics, many teachers in colleges, Y. W. C. A.'s, private schools, and public schools enrolled for the summer course. They came from Virginia and California, from Washington and New York, and from most of the states in between. They, too, wanted to know first-hand about this system of gymnastics which has lost its boring formality and has become, in the hands of these Danish people, a work that creates an atmosphere of joyous abandon and increases health-giving values.

This is more significant than at first appears. Several states have recently legislated for compulsory physical education in the schools which makes the subject important to many groups of people—especially so to the school child. Physical education must be a part of every child's life. He cannot endure it or master it joyfully for a year or two and dispense with it at the end of that time. He must have physical education from kindergarten to his junior year in college. Then only is he considered physically fit and his body welfare left to his own keeping.

Every one who has been through the regulation periods of formal gymnastics can readily realize why such a system failed to carry through—why its appeal would be short-lived at the present day. With all due respect to Ling, the originator of the so-called "Swedish gymnastics" and to all his worthy followers, who have developed systems of corrective health work that have

been a boon to thousands—the system of physical education as we have received it in America for the past years has lost the essence, the vitality, that makes it a living subject.

Visit the schoolrooms today and you will find, under the name of physical education, everything from mere walking out-of-doors to dancing and turning cartwheels. American schools are gradually dropping formal gymnastics from the physical-education program and physical educators are writing books to help in teaching the more informal work. These books give perhaps two hundred pages to games and sports, fifty pages to dancing, and three to gymnastics. Modern advocates of natural dancing are urging that gymnasium classes learn the lessons of muscle control by dancing.

Detroit schools decided that, if boys of today could do the stunts which their grandfathers and great-grandfathers of the pioneer days could do, their bodies would acquire the necessary strength and agility to cope with today's problems. Consequently, their boys are learning to do the handsprings, cartwheels, elephant walk, and bear dance.

Just as America is beginning to accept her own ingenious substitutes; when she is feeling certain that by combined dancing, sports, and stunts she has a well-rounded program to offer her youth, Denmark has a word to say. Niels Bukh, Eli Bjorksten, and Agneti Bertram, the three outstanding Danish leaders, tell us that sports alone are not enough, for they often develop muscle-bound enormities. They tell us that dancing is splendid, but neither does it suffice in detecting the weak spots in the human anatomy. When our boys are doing the hand-stand even better than their great-uncle could do it, they may be developing hyper-extension of the lumbar curve.

The Danish people have a real system—a life-giving, fun-making, defect-erradicating system of gymnastics. The formal gymnastics are no longer formal but they are, and must, be gymnastics which not only exercise every stray muscle and joint of the body but also train each muscle and joint to accomplish movements that its owner never dreamed possible.

For the time being, at least, the knowledge gained by these teachers who have studied Danish gymnastics, either at home or abroad, will be used in our American schools. We will undoubtedly find the Danish gymnastics incorporated into tomorrow's physical education program, together with the sports, the dancing, and, yes, the stunts.

ERNA DRIFTMIER

Clarinda, Iowa

REVIEWS

TERRY, PAUL W. *Extra-Curricular Activities in the Junior High School.* Baltimore, Maryland, Warwick and York, 1926. 122 pp.

In chapter three of the *Twenty-fifth Yearbook of the National Society for the Study of Education*, Dr. Paul W. Terry gives a brief survey of current practices in the extra-curricular activities in junior high schools. The volume recently published by Warwick and York contains more complete data, of which the earlier chapter was a synopsis. As a basis for this text the author secured information from eighty-two junior high schools regarding their extra-curricular activities. Twenty-five of these schools enrolled less than five hundred pupils; twenty-five, from five hundred to nine hundred ninety-nine; and twenty-four, more than one thousand.

Those who are at all familiar with the contents of the *Twenty-fifth Yearbook* will not be surprised at the varied reports from these representative schools. The reader cannot but be impressed by the large number of organizations, ranging from seven to thirty-eight in a single school and the great variety among these organizations—there were forty-six, each of which was reported by at least two schools. The methods for determining membership in these groups, also varied, as did the matter of records, the credit given for participation, and the relation of the organizations to principal and teachers. Data from the schools reporting are given upon each of these phases of the extra-curricular program.

Dr. Terry has not attempted to answer the questions of the administrator in this field. In fact his list of unsolved problems in the last chapter is somewhat typical of the entire book. He has pictured the extra-curricular situation as it actually exists in some of the more progressive schools, with its attendant problems, and then indicated the general solution of these problems. The book will be most valuable as a source of material for the further study of non-curricular activities.

FLOYD T. GOODIER

Chicago Heights

HOLLINGWORTH, LETA S. *Gifted Children: Their Nature and Nurture.* New York, Macmillan Company, 1926. xxiv + 374 pp.

This book, admirably conceived and well executed, is a thorough-going summary of our present-day knowledge about gifted children and the educational problems which they present. Its twelve chapters cover the following subjects: history of research on gifted children, methods of identification, physical growth and motor ability, character and interests, heredity, special

talents, case studies of children having intelligence quotients of more than 180, experimental education of the gifted, organization of curriculum, and socio-economic implications.

On most of the above topics, Dr. Hollingworth has herself made important investigations, and her book is, therefore, by no means a mere summary of the work of others. The facts are presented so clearly and interestingly that the book should prove helpful to the average teacher or to any reasonably intelligent parent. The discussions are sane and the conclusions are justified by the available facts. Perhaps the reviewer is somewhat favorably biased by finding his own conclusions confirmed at practically every point!

As an educational solution of the problem of the highly gifted child, the author argues for a combination of rapid progress and segregation. Extremely valuable suggestions are given with reference to desirable modifications of curriculum and methods. The book cannot be too highly recommended.

LEWIS M. TERMAN

Stanford University

HERTZBERG, OSCAR E. *A Comparative Study of Different Methods Used in Teaching Beginners to Write.* New York, Teachers College, Columbia University, 1926. 61 pp. (Teachers College, Columbia University, Contributions to Education, No. 214)

This is a useful study which appears to settle one of the moot questions in the teaching of handwriting. The Montessori method approaches writing by tracing the outlines of the letters with the finger, the purpose of which is to give the child the sensations of movement that correspond to the letter forms. Hertzberg compared the progress of three groups of kindergarten children, who began their practice in writing by tracing, with that of a group which used direct practice on the words from the outset. This practice continued for fifteen days, five minutes a day, except for one group which used some direct practice. All groups then used direct practice for seven days. The groups were equated at the start.

The group which used direct practice made decidedly more rapid progress than did the other groups. Tracing through transparent paper gave the next most rapid progress, while tracing in a groove, sandpaper tracing, and finger tracing gave the poorest results. A combination method, consisting of ten days of tracing and five days of direct practice gave results somewhat poorer than the direct method. The study gives good evidences that extensive use of tracing is uneconomical, and that direct practice is the best. This is undoubtedly due to the fact that in direct practice the active selection of motor impulses is going on, and the connection is being made between the perception and the movement.

FRANK N. FREEMAN

University of Chicago

BUSWELL, G. T. *Diagnostic Studies in Arithmetic.* Chicago, University of Chicago Press, 1926. xiii + 212 pp. (Supplementary Educational Monographs, No. 30)

This monograph may be considered a major contribution to the science of elementary education. It probably is too difficult reading for many classroom teachers, but much of its contents should be passed on to them by school supervisors through the teachers' meetings.

Eye-movements used in column addition of whole numbers is the first method of diagnosis reported. These vary significantly between good and poor performers on this function. Regular eye-movements evenly spaced are used by those skilled in addition. Whether such eye-movements can be taught, and if so how, is not reported.

A second method of diagnosis is the time measure of doing each item in complicated processes such as long division. This shows that a particular process took a long time or short time, but it does not show what was going on in the mind of the worker during the time interval. The variations in time intervals between workers and between different types of processes in the same worker are slightly confusing and at times apparently contradictory. Both of the above methods, although exceedingly "scientific" in the prudish sense of the word, yielded disappointing results to the reviewer who insists that Buswell can make a technique yield as much acute observation upon the problem as any one now operating in elementary education.

The third method, and the most satisfactory, is a carefully controlled observation of children's errors as they work and an entrance into the child's mind by way of a standardized interview with him. This method is a wise, refined, and vigorous use of questioning. It yielded a long list of specific errors made—in some cases statistically significant differences in the frequency of specific errors—and often turned up data which can be used to figure out why some errors are made. Such knowledge can obviously be used in the improvement of first learning as well as in directing remedial work after poor teaching and textmatter have done their damage. The author makes several observations concerning textbooks that those who are responsible for selecting textbooks would do well to study earnestly.

F. B. KNIGHT

State University of Iowa

DOUGLAS, HARL R. *Modern Methods in High School Teaching.* Boston, Massachusetts, Houghton Mifflin Company, 1926. xviii + 544 pp.

This book is at once a clear discussion of methods and devices now used in high-school teaching and a manual to which teachers can refer for guidance and assistance. Unlike so many books on method it is not written primarily for the undergraduate teacher in training. Teachers of experience, as well as beginning teachers, will find it most useful.

It is helpful, because it surveys quite comprehensively the various phases of teaching activity. Thus not only do the conventional topics, of questioning, assignment, planning, quizzes, marks and examinations, receive consideration

in a manner far from trite, but such methods, as supervised study, visual instruction, the socialized recitation, the project and the problem methods, are thoroughly examined ever with an eye to the practical schoolroom situation in the typical high school. To the consideration of such problems there is added a discussion of standardized tests, new type examinations, and the technique of controlled classroom experimentation which is designed particularly for teachers who are untrained alike in administering standardized tests or in statistical methods of procedure.

The book smells of the soil. Professor Douglas has had experience in high-school teaching and supervision, and this first-hand contact with the problems of teaching has enabled him to write a most valuable manual of reference. This practical character of the book is at once its strength and its weakness. Its chief limitation consists in its failure to appraise the multitude of methods described in the light of a fundamental philosophy of secondary education. The author apparently assumes that it is not his function to give a perspective which will enable those who read his book to fit the many methods considered into their appropriate places in secondary-school teaching. There results at times a rather muddled discussion, for example, in connection with the problem and the project methods of teaching; and there is no attempt to integrate such methods as individual instruction, supervised study, the socialized recitation, and the project method into an organic teaching method such as H. C. Morrison has presented admirably in his book on *The Practice of Teaching in the Secondary School.*

Nevertheless Professor Douglas has produced a book which progressive teachers will consider well-nigh indispensable. Not the least of its virtues is the comprehensive bibliography which follows each chapter.

V. T. THAYER

Ohio State University

AVERILL, LAWRENCE A. *Educational Hygiene.* Boston, Houghton Mifflin Company, 1926. xiii + 546 pp.

The author professes to stress two things, the importance of health and the teaching of health to children. He has presented a general discussion of educational hygiene which he defines as comprised of "child hygiene, school hygiene, personal hygiene, community hygiene, mental hygiene, physical education, and the pedagogy of hygiene." He thus sets for himself the task of covering an extensive field and in the Preface grants that there are "glaring omissions" made "unavoidable in a volume which aims to cover the extensive ground which the present one does." The comprehensiveness of the book will doubtless tend to confuse the immature student of the teacher-training school for whom it has been prepared.

In chapter III, "A Hygiene Outline by Grades," the teacher will find some suggestive material of value. At the end of each chapter there is a list of topics "for special study and report," some of which may be useful.

Why it should be necessary in the chapter on hygiene of the skeleton to take fifteen pages to review the names of the bones and to discuss their

articulation is hard to understand. Similarly, sixteen pages are used to discuss the structure of muscles. Certainly prospective teachers who have been admitted to our teacher-training institutions should have a fundamental knowledge of physiology that would make such a presentation unnecessary. About one-fifth of the book is devoted to a "Structural Approach" which is merely a review of elementary physiology.

The author lists thirty-one references in a selected bibliography which are to be read as supplementary material. These "should represent the minimum of outside reading required in connection with the course in educational hygiene." Unfortunately, only thirteen of twenty-seven of these books available were found to have a copyright date of 1920 or later. In view of the many excellent books published since 1920 in the various fields designated by the author as covered in this volume, the bibliography should have been more carefully selected.

C. C. McCracken

Ohio State University

Freeman, Frank N. *Mental Tests: Their History, Principles, and Applications.* Boston, Houghton Mifflin Company, 1926. ix + 503 pp.

This book is a scholarly discussion of mental tests in all their aspects, not only the so-called "intelligence tests" but also tests of various aspects of personality. As a very fitting introduction to the subject, the reader is invited to take a representative mental test and score it himself.

On two occasions, the author comments upon the discrepancy between the assumptions underlying the intelligence quotient and index of brightness, and expresses regret that the facts are not better known. It was only after much hesitation and deliberation that the reviewer introduced the index of brightness as a means of interpreting scores since, as shown by the author, it is based on the assumption that the variability of scores remains approximately constant for the ages to which the test is suited. A number of charts are given which clearly illustrate the tendency for the variability of scores in several widely used group tests to be approximately constant within the range of ages for which the test is used. It would seem then that the basis for the index of brightness is fairly well established and that what remains is to see the cause for the difference in the nature of distributions between group tests and the Binet Test.

Some of the simple methods of tabulating scores, as well as, some of the educational uses of mental tests are discussed together with their applications to vocational guidance and selection, and the relation of intelligence to delinquency. The impression gained from a perusal of the book is that it will be of interest principally to the student rather than to the busy teacher. That is, it is a book to be studied carefully rather than one to be read cursorily. It is an excellent textbook for a course in mental testing, especially an advanced course.

A. S. Otis

World Book Company

BENNETT, CHARLES A. ***History of Manual and Industrial Education Up to 1870.*** Peoria, Illinois, Manual Arts Press, 1926. 461 pp.

Later historians, with a longer perspective, will undoubtedly name the present phenomenal development of the practical arts and vocational phases of education a second Renaissance—or a delayed consummation of the first—in its extension, literally, to "all the people." Educators interested in this development have generally found themselves too busy administering it to give extended study or report to its origins and earlier course. Bennett's history appears as the first comprehensive presentation of those earlier centuries of growth in manual and industrial education in slow, laborious growth, yet especially rich in human interest and social significance.

Among its notable services to education, this publication does much to dispel the confidence, still sedulously nurtured by some, that this modern development of universal education—contained chiefly in its practical phases—is mutational at best and destined to a mushroom existence. Mr. Bennett's work, even in the absence of a concluding volume, discloses it as a social emergence which is continuous in growth, with roots as deep as the soil of civilization.

The author is represented as having devoted years to research and preparation of this book. The product substantiates the claim and justifies the sustained effort. Source materials rare and difficult to command, both descriptive and illustrative in character, have been woven into an interesting story of educational development which seems historically complete and authentic. In the wealth of detail assembled and digested, leaders, heretofore seen as more or less isolated figures, take their places of eminence in a continuous procession of workers toward the universal education approximated only in our time.

The substantial and artistic workmanship, paper, type, prints, and binding appear in harmony with the contents. This is wholly desirable, although, unfortunately, it makes prohibitive a popular price necessary to a wide circulation which the publication deserves. It is to be hoped that the concluding volume may not be long delayed.

WILLIAM H. STONE

Ohio State University

REEDER, WARD G. ***The Ethics of the Teaching Profession.*** Report of the Committee on Ethics of the Profession. Washington, D. C., National Education Association, 1926. 61 pp.

Indications that a professional consciousness has begun among teachers, and that the teachers themselves are calling what they practice a "profession," is evidenced in educational circles today. One such indication is given in the report on *Ethics of the Teaching Profession*, prepared by Dr. W. G. Reeder for the National Education Association Committee on Ethics of the Profession, for when any group formulates a code of practice and conduct it is

seemingly placed nearer the status of a recognized profession. Dr. Reeder's study is a step toward the definite expression of an ethical code for teachers.

The history of the general movement toward formal codes of ethics for various groups, particularly among teachers, is considered briefly. Characteristics of teachers' codes are classified according to such headings as "Training and Professional Growth," "Salary and Advancement," "Contracts and Tenure," and "Relations with Pupils." The special ideas embodied in particular codes of the different states are given under the respective headings. These are summarized in a convenient table which appears at the end of the report. That a great deal of careful labor has gone into this study is evident, and the author is to be commended for the completeness and convenience of the classification.

The codes presented contain stipulations relating to conduct varying all the way from that so obvious as to be taken for granted among civilized men, to that involving social questions far outside the realm of any special professional ethics. Unless this range is realized it seems likely that the professional status of teachers will be alarmingly little improved by this movement to formulate a special code of ethics for the profession. Professor Reeder warns that "much research, much hard and purposeful thinking, still needs to be done to determine what pronouncements should go into a code of ethics for teachers." Should anyone be disposed to seek evidence of the overwhelming importance of that warning, an earnest and prayerful consideration of the report will supply him with ample material.

T. L. Scholtz

Ohio State University

Woodyard, Ella. *The Effect of Time upon Variability.* New York, Teachers College, Columbia University, 1926. v + 56 pp. (Teachers College, Columbia University, Contributions to Education, No. 216)

This monograph is an attempt to answer such questions as the following: Does an individual vary in his performance on mental tasks at different times? Is this variability dependent in part upon the amount of time elapsing between successive performances? Is such variability found in a wide range of types of tasks such as cancelling digits, naming colors, subject-matter achievement tests, and college entrance tests?

That the individual does vary in his performance from time to time is well shown by the discrepancies between individual scores of different testings, a common measure of which is the correlation coefficient. The writer believes that while time may be a slight factor in variability of score in the type of tests used, for practical purposes in dealing with the individual, it can enter at a very slight weight or even be neglected. The performance is as likely to be different after a few minutes as after days or weeks. In determining the reliability of a testing instrument, the time elapsing between successive testings is of small consequence. However, in attempting to answer such questions as the author's, one must be careful that the variability is not due to

unreliability of the tests used as school progress—mainly changing the difficulty level of the test material.

This study is a step toward establishing conditions that might be considered as fundamental to setting up "standard reliabilities" so that when a reliability coefficient of 0.78 is given, the conditions of its derivation are known and the coefficient can be directly compared with other "standard reliability" coefficients.

Further investigations of this subject and related subjects should be by specific experiments, carefully set up so as to adequately account for factors of unreliability of test instrument, practice effect, relative difficulty of the material, and range of ability of subjects.

HAROLD A. EDGERTON

Ohio State University

RANDALL, JOHN HERMAN, JR. *The Making of the Modern Mind: a Survey of the Intellectual Background of the Present Age.* Boston, Houghton Mifflin Company, 1926. x + 653 pp.

The mind of the man of today is, in the words of the author, "a mosaic of bits and pieces gathered from here and there along the journey through the ages, set into new patterns to serve the needs and the tastes" of today. In order to help us to understand the intellectual life of the present and to take an intelligent, objective attitude toward it, the author traces the great movements—religious, philosophical, scientific—which have successively influenced the thinking of the Western World, and which have left traces in the present. The period covered is from the thirteenth century to the twentieth; from the age of Thomas Aquinas and Dante to that of Einstein, Mussolini, and John B. Watson. The book is not concerned with the details of the theories of Luther, Copernicus, Descartes, Newton, Kant, and others, but shows how the central idea of each of these influenced the thinking of men in all fields. There is an abundance of quotation, "for it has seemed best to try to look at the development of thought with the eyes of those who have participated in it."

In a book of such wide scope, there will naturally be disagreement with the judgment of the author on certain points, particularly in matters of selection and emphasis. It seems to the reviewer, for instance, that Dr. Randall, in his admiration for the intellectual life of the thirteenth century, and his emphasis on the importance of the changes that took place in the seventeenth and eighteenth centuries, underestimates the importance of the humanistic movement of the Renaissance. Whatever faults there may be, are far outweighed, however, by the breadth with which he has conceived his task, his sympathetic attitude toward the life of the past, and the objectivity of his treatment of our own time. This does not profess to be a work on education, but it should be of great value to the student who wishes to see the development of our educational history as a part of the life of the successive periods during which that development has taken place. This is particularly true

since the histories of education written in English have tended to stress the institutional background at the expense of the intellectual.

R. H. ECKELBERRY

Ohio State University

STRANG, RUTH. *Subject-Matter in Health Education.* New York, Teachers College, Columbia University, 1926. 108 pp. (Teachers College, Columbia University, Contributions to Education, No. 222)

The author frankly takes as her task the determination of subject-matter in texts and courses of study on physiology and hygiene, now in use in the schools, and an explanation of how the facts may be most effectively mastered. The reviewer is puzzled to know why she selected the texts and courses of study which she included for examination. There is no evidence given which indicates that the author made a representative selection or guarantees that the selection is typical of the most modern views on health education. It is supposed that the author was concerned with the discussion of the best methods of teaching health knowledge and selected her material accordingly. If this supposition is correct, her selection would be justified provided she had so explained it. We might have doubted the wisdom, but not the logic, of the selection.

In the opinion of the reviewer, we are justified in attempting to work out a program of health education on the basis of knowledge gained and with the purpose of teaching and testing knowledge. He found in some recent experiments, almost no relation between the health knowledge and the health practices of children. As a matter of fact, children who could make a median score of 85 percent on the Gates-Strang Health Knowledge Test, showed a score of less than 15 percent on a survey of their health practices at home. Children who knew perfectly well how and when to use the toothbrush never had seen one outside the store or classroom.

A book of this kind, while scientifically worked out within the limits of the problem set for solution, is likely to do more harm than good, because it will turn the attention of the teacher from the real problem of health education. Health depends upon what one does and not merely upon what one knows. Providing tests for the acquisition of knowledge and setting up instruction as the objective of health is, therefore, no health course at all.

E. GEORGE PAYNE

New York University

STRAYER, GEORGE D., ENGLEHARDT, N. L., AND OTHERS. *Report of the Survey of the Schools of Tampa, Florida.* New York, Bureau of Publications, Teachers College, Columbia University, 1926. xxv + 308 pp.

Somewhat in contrast with the majority of earlier school surveys those of recent years have tended toward specialization. This extensive report represents in a sense a return to earlier tendencies, since it is a general survey rather than a survey of a specific problem. Yet, it is not extensive in the

sense of being superficial, the major administrative problems of the school system have been treated with care and adequate detail.

The range of problems covered by the survey naturally makes its organization more difficult than would be the case in a more specialized study. The problem of the more effective organization of the school system is rightly considered first. The building program, commonly one of the major items, is treated quite briefly, although possibly adequately, in about forty pages.

The educational results achieved in Tampa were measured by pupil progress, by the holding power of the schools, and by tests of achievement. In the analysis of pupil progress little attention is paid to the fact that the age-grade relationship is not in itself an adequate index of relative progress. The location of pupils of a specified age is used as the basis for a novel calculation of holding power. Achievement throughout the school system was measured by the Thorndike-McCall Silent Reading Scales, the Woody-McCall Mixed Fundamentals in Arithmetic, the Nassau County Supplement to the Hillegas Composition Scale, and the Thorndike Handwriting Scale. Other tests were used more intensively in certain selected schools as an aid in the problems of pupil classification, which is treated with more than usual care.

The survey staff has brought out the problems of the school system for the administration. It should be of great local value in correcting and anticipating defects. Incidentally, it is a volume which may be read with much profit by all students of school administration and survey methods.

HARRY A. GREENE

University of Iowa

PUBLICATIONS RECEIVED, OCTOBER 15 TO NOVEMBER 15

BOOKS FOR EDUCATIONAL EXECUTIVES

Hansen, A. O. *Liberalism and American education in the eighteenth century.* New York, Macmillan, 1926. 317 pp. $2.50.

Jones, T. J. *Four essentials of education.* New York, Scribner, 1926. 188 pp.

Kilpatrick, W. H. *Education for a changing civilization.* New York, Macmillan, 1926. 143 pp. $1.00.

Lerrigo, M. O. *Health problem sources.* New York, Teachers College, Columbia Univ., 1926. 151 pp. (Contributions to education, no. 224) Cloth, $1.50. Paper, $1.25.

Mearns, Hughes. *Creative youth; how a school environment set free the creative spirit.* Garden City, N. Y., Doubleday, Page, 1926. 234 pp. $2.50.

Payne, E. G., and Gebhart, J. C. *Method and measurement of health education; an experiment in Public School 106, Manhattan, New York City.* New York, New York Assn. for Improving the Condition of the Poor, 1926. 43 pp. $.35.

Rice, E. A. *A brief history of physical education.* New York, A. S. Barnes, 1926. 276 pp. $2.00.

Taylor, R. B. *Principles of school supply management.* New York, Teachers College, Columbia Univ., 1926. 145 pp. (Contributions to education, no. 228) Cloth, $1.50. Paper, $1.25.

Totah, K. A. *The contribution of the Arabs to education.* New York, Teachers College, Columbia Univ., 1926. 105 pp. (Contributions to education, no. 231). Cloth, $1.50. Paper, $1.25.

Weidemann, C. C. *How to construct the true-false examination.* New York, Teachers College, Columbia Univ., 1926. 118 pp. (Contributions to education, no. 225) Cloth, $1.50. Paper, $1.25.

Youth and the beautiful. Pittsburgh, Pa., Henry C. Frick Educational Com., n.d. 80 pp. (School betterment studies. Vol. 1, no. 1)

BOOKS FOR PSYCHOLOGISTS

McHale, Kathryn. *Comparative psychology and hygiene of the over-weight child.* New York, Teachers College, Columbia Univ., 1926. 123 pp. (Contributions to education, no. 221) Cloth, $1.50. Paper, $1.25.

Piaget, Jean. *The language and thought of the child.* New York, Harcourt, Brace, 1926. 246 pp. $3.75.

BOOKS FOR TEACHERS AND SUPERVISORS

Barton, J. R., and others. *Elementary teacher's organization book.* Lincoln, Nebr., Univ. Pub. Co., 1926. 95 pp.

Barton, J. R., and others. *Junior and senior high school teacher's organization book.* Lincoln, Nebr., Univ. Pub. Co., 1926. 95 pp.

Clapp, F. L., and Risk, T. M. *Better teaching; a handbook for teachers and supervisors.* New York, Silver, Burdett, 1926. 58 pp. $.68.

Crawford, C. C. *Methods of study.* Los Angeles, Calif., The Author, 1926. 163 pp.

Gale, R. J. *Elements of child training.* New York, Holt, 1926. 299 pp. $2.00.

Greenlaw, Edwin, and Miles, Dudley. *Teaching literature; a handbook for use with the literature and life series.* Chicago, Scott, Foresman, 1926. 168 pp. $.50.

Gruenberg, B. C. ed. *Guidance of childhood and youth; readings in child study.* New York, Macmillan, 1926. 324 pp. $1.50.

Headley, L. A. *How to study in college.* New York, Holt, 1926. 417 pp. $3.00.

Holmes, M. D. *Handbook of suggestions and course of study for subnormal children.* Mountain Lake Park, Md., National Pub. Society, 1926. 110 pp. $1.50.

Langmack, H. C. *Football conditioning.* New York, A. S. Barnes, 1926. 48 pp. $1.50.

Wootten, K. W. *A health education procedure for the grades and grade teachers.* New York, National Tuberculosis Assn., 1926. 420 pp. $1.00.

BOOKS FOR HIGH-SCHOOL STUDENTS

Augier, Émile, and Sandeau, Jules. *Le gendre de Monsieur Poirier.* Ed. by C. S. Parker. Boston, Allyn & Bacon, 1926. 239 pp. $.80.

Austin, W. A. *A laboratory plane geometry.* Chicago, Scott, Foresman, 1926. 392 pp. $1.40.

Betz, Frederick, and Price, W. R. *A first German book.* New York, American Bk. Co., 1926. 448 pp. $1.44.

Brownlee, R. B., and others. *Elementary principles of chemistry.* Rev. ed. Boston, Allyn & Bacon, 1926. 596 pp. $1.60.

Grose, H. B. *College composition.* Chicago, Scott, Foresman, 1926. 679 pp. $2.00.

Harman, R. V., and others. *American citizenship practice.* Lincoln, Nebr., Univ. Pub. Co., 1926. 613 pp. $1.75.

Hawkes, H E., and others. *New complete school algebra.* Boston, Ginn, 1926. 625 pp. $1.60.

Irving, Washington. *A tour of the prairies.* Ed. by J. B. Thoburn and G. C. Wells. Oklahoma City, Okla., Harlow Pub. Co., 1926. 251 pp. $.85.

Janer, Felipe. *Selecciones poéticas.* New York, Silver, Burdett, 1926. 510 pp. $2.40.

Johnson, R. I. *Clear, correct English.* Boston, Allyn & Bacon, 1926. 165 pp. $1.00.

Lamb, Charles, and Lamb, Mary. *Tales from Shakespeare.* Selected and ed. by M. R. Fitzpatrick. Boston, Allyn & Bacon, 1926. 392 pp. $1.00.

Lee, J. M. *Business ethics.* New York, Ronald Press, 1926. 312 pp. $3.25.

Lord, E. W. *The fundamentals of business ethics.* New York, Ronald Press, 1926. 196 pp. $2.75.

Lot-Borodine, Myrrha, and Schoepperle, Gertrude. *Lancelot et Galaad, mis en nouveau langage.* New York, Oxford Univ. Press, 1926. 226 pp. $1.10.

Lowndes, W. S. *Painting and wood finishing.* Philadelphia, David McKay Co., 1926. 98 pp. $1.50.

Lyman, E. A., and Darnell, Albertus. *Elementary algebra, second course.* New York, American Bk. Co., 1926. 272 pp. $1.24.

McKenzie, Kenneth, and Hamilton, Arthur. *Elementary French grammar.* New York, Century, 1926. 324 pp. $1.50.

Manley, J. M. comp. *English prose and poetry.* Boston, Ginn, 1926. 882 pp. $3.20.

Marden, C. C., and Tarr, F. C. *A first Spanish grammar.* Boston, Ginn, 1926. 300 pp. $1.48.

Matthews, M. L. *The house and its care.* Boston, Little, Brown, 1926. 413 pp. $1.50.

Nichols' junior business training. New York, American Bk. Co., 1926. Parts 1-2. $1.20.

Otto, W. N. *Journalism for high schools.* New York, Harcourt, Brace, 1926. 318 pp. $1.48.

Palmer, C. I., and others. *Plane and solid geometry.* Rev. ed. Chicago, Scott, Foresman, 1925. 526 pp. $1.80.

Parsons, C. A., and Little, C. E. *First Latin lessons for junior and senior high schools.* Boston, Heath, 1926. 308 pp. $1.40.

Quear, C. L. *School and home gardens.* Lincoln, Nebr., Univ. Pub. Co., 1926. 248 pp. $.80.

Rich, F. K. *Caleb Peaslee.* Philadelphia, Henry Altemus Co., 1926. 342 pp. $2.00.

Scott, Sir Walter. *Ivanhoe.* Abr. and ed. by J. C. Tressler. Boston, Allyn & Bacon, 1926. 669 pp. $1.00.

Shideler, E. H. *Modern school problems: an elementary study of American social life and institutions.* Ann Arbor, Mich., Edwards Bros., 1925. 307 pp. $2.75.

Todd, David. *A new astronomy.* New York, American Bk. Co., 1926. 480 pp. $1.80.

Uhler, J. E. *A review of English grammar.* New York, Harper & Bros., 1926. 179 pp. $.90.

Walker, A. T. ed. *Caesar's Gallic war.* Rev. ed. Chicago, Scott, Foresman, 1926. Books 1-4. 558 pp. $1.40. Books 1-7. 702 pp. $1.72. Text ed. 200 pp.

Ward, C. H. *The M. O. S. book: a text designed to "maintain the skills" of composition learned in the earlier years.* Chicago, Scott, Foresman, 1926. 215 pp. $.60. Teacher's manual. 94 pp. $.50.

Wilkins, L. A. *New second Spanish book.* New York, Holt, 1926. 565 pp. $1.56.

BOOKS FOR JUNIOR HIGH-SCHOOL STUDENTS

Briggs, T. H., and others. *Junior high school English.* Boston, Ginn, 1926. Book 1. 402 pp. $1.12. Book 2. 421 pp. $1.20.

DeGroat, H. D. *The Iroquois arithmetics for school and life.* Syracuse, N. Y., Iroquois Pub. Co., 1926. Book 3. 350 pp. $.88.

King, C. L., and Barnard, J. L. *Our community life.* Philadelphia, Winston, 1926. 610 pp. $1.48.

Niver, H. B. *A school history of England.* Rev. ed. New York, American Bk. Co., 1922. 432 pp. $1.20.

Spaulding, F. E., and others. *Aldine third language book, for grades seven and eight.* New York, Newson, 1926. Teachers ed. 432 pp. $1.00.

Thorndike, E. L. *The Thorndike junior high school mathematics.* Chicago, Rand McNally, 1926. Book 3. 312 pp. $.96.

BOOKS FOR ELEMENTARY-SCHOOL STUDENTS

Albinger, L. C. *Health in eating, a food project.* Chicago, Ideal School Supply Co., 1925. 12 sheets.

Albinger, L. C. *The needs of man: how they are supplied.* Chicago, Ideal School Supply Co., 1925. 13 sheets.

Dalgliesh, Alice. *West Indian play days.* Chicago, Rand McNally, 1926. 174 pp. $.80.

Dickson, M. S. *American history for grammar schools.* Rev. ed. New York, Macmillan, 1926. 655 pp. $1.60.

Gilmartin, J. G. *The vocabulary speller.* New York, Scribner, 1926. Book 2. 127 pp. $.60.

Henriksen, Alpha. *Test and practice material.* Philadelphia, Winston, 1926. Winston primer, Units 1-2. $.16 each. Winston first reader, Units 1-2. $.20 each. Manual. 48 pp. $.20.

Kern, E. K., and George, M. M. *Little journeys to Alaska and Canada.* Chicago, Flanagan, 1926. 93 pp. $.76.

Knight, F. B., and others. *Arithmetic work book.* Chicago, Scott, Foresman, 1926. Grade 3. 74 pp. Grade 7. 74 pp. $.36 each. Grade 3, teacher's ed. 74 pp. $.48.

Knight, F. B., and others. *Standard service arithmetics.* Chicago, Scott, Foresman, 1926. Book 1. 385 pp. $.80. Book 3. 547 pp. $.96. Answer book for book 3. 30 pp.

Leetch, D. L. *Annetje and her family.* Boston, Lothrop, Lee, 1926. 216 pp. $1.25.

Linderman, F. B. *Kootenai why stories.* New York, Scribner, 1926. 166 pp. $2.00.

Lindsay, Maud. *The toy shop.* Boston, Lothrop, Lee, 1926. 157 pp. $1.50.

McSpadden, J. W. *Ohio: a romantic story for young people.* New York, J. H. Sears & Co., 1926. 128 pp. $.90.

Norwood, E. P. *The other side of the circus.* Garden City, N. Y., Doubleday, Page, 1926. 276 pp. $1.50.

Prout, F. J., and others. *Thought test readers.* Lincoln, Nebr., Univ. Pub. Co., 1926. Third grade. 216 pp. $.76. Test sheets.

Smedley, E. A., and Olsen, M. C. *The new primer.* Chicago, Hall & McCreary, 1926. 128 pp. $.60.

Sullivan, M. E., and others. *Beacon gate to reading.* Boston, Ginn, 1926. Teachers Manual. 168 pp. $.72.

Terry, A. G. ed. *History stories of other lands.* Chicago, Row, Peterson, 1926. Book 1, Tales from far and near. 122 pp. $.76. Book 2, Tales of long ago. 122 pp. $.76. Book 3, The beginnings. 187 pp. $.88. Book 4, Lord and vassal. 238 pp. $.88. Book 5, The new liberty. 282 pp. $.96. Book 6, The modern world. 400 pp. $.96.

Youmans, Eleanor. *Skitter Cat and Little Boy.* Indianapolis, Ind., Bobbs-Merrill, 1926. 144 pp. $1.50.

EDUCATIONAL RESEARCH ASSOCIATION

TENTATIVE PROGRAM

for the Dallas Meeting of the

EDUCATIONAL RESEARCH ASSOCIATION

CLOSED MEETING, SECTION I

"The Adequacy of the Formula for Corrections for Chance in Tests," G. M. RUCH, *Professor of Education, University of California*

"A Unitary System for the Measurement of Nature and Nurture," S. A. COURTIS, *University of Michigan*

"A Report on a Comparison of Two Methods of Reading as Used by Intermediate Grade Children," C. T. GRAY, *Professor of Education, University of Texas*

"Report on an Investigation of Eye-Movements in the Reading of Foreign Languages," G. T. BUSWELL, *Associate Professor of Education, University of Chicago*

"The Constancy of Performance of Z and Y Students," RALEIGH SCHORLING, *Professor of Education, University of Michigan*

"Achievement in Seven-Grade Systems versus that in Eight-Grade Systems," CLARA MALLORY, *Director, Educational Research, Beaumont, Texas*

CLOSED MEETING, SECTION II

"A Controlled Study of the Learning of Multiplication by Third-Grade Children," JOHN GUY FOWLKES, *Professor of Education, University of California*

"The Beginning of an Elaborate Grade-Placement Study in Elementary Arithmetic," CARLETON W. WASHBURNE, *Superintendent of Schools, Winnetka, Illinois*

"Experimental Data to Support the Use of Certain Types of Drill Material in Arithmetic," F. B. KNIGHT, *Professor of Education, University of Iowa*

"A Plan for Rating Schools on the Basis of Efficiency," E. E. KENNER, *Director of Instructional Research, Chicago*

Discussion led by ERNEST C. WITHAM, *Director of Research*, Wilmington, Delaware

"The Relation of Certain Independent Variables to Achievement in the Secondary School," FREDERICK L. WHITNEY, *Department of Educational Research, Colorado State Teachers College*

OPEN MEETINGS

MONDAY, 2:00 P.M.

First Presbyterian Church

(Corner Harwood and Wood Streets)

"A Technique for the Analysis of the Teacher's Functions," W. W. CHARTERS, *Professor of Education, University of Chicago*

"Leadership in Educational Research," B. R. BUCKINGHAM, *Director, Bureau of Educational Research, Ohio State University*

"Some New Things That Are Really Old," WILLIS L. UHL, *Professor of Education, University of Wisconsin*

"Newer Types of Taxation for Public Schools," FLETCHER H. SWIFT, *Professor of Education, University of California*

"The Ability and Effort of States to Support Education," JOHN K. NORTON, *Director, Research Division, National Education Association*

"A Comparison of the Accomplishment in English and American Secondary Schools," SAMUEL R. POWERS, *Associate Professor of Natural Science, Teachers College, Columbia University*

"School Savings Banks from the Viewpoint of Children and Their Parents," J. CAYCE MORRISON, *Assistant Commissioner for Elementary Education, State Department of Education, Albany, New York*

WEDNESDAY, 2:00 P.M.

First Presbyterian Church

(Corner Harwood and Wood Streets)

"Factors Influencing Transfer," ERNEST HORN, *State University of Iowa*

"Ways and Means of Reorganizing and Improving Instruction in Reading," W. S. GRAY, *Dean, College of Education, University of Chicago*

"Psychological Studies in the Organization of Curriculum Materials," HAROLD RUGG, *Lincoln School, New York City*

"The Ability and Interests of Eight Hundred High-School Seniors," CLIFFORD WOODY, *University of Michigan*

"Non-School English of High-School Children," E. J. ASHBAUGH, *Assistant Director, Bureau of Educational Research, Ohio State University*

"Kindergarten Training as Affecting Later School Progress and Achievement," HARRY A. GREENE, *Director, Bureau of Educational Research, University of Iowa*

Discussion led by E. E. KEENER, *Director of Instructional Research, Chicago*

JOINT MEETING OF THE NATIONAL SOCIETY OF COLLEGE TEACHERS OF EDUCATION AND THE EDUCATIONAL RESEARCH ASSOCIATION

TUESDAY

"Possibilities of Objective Techniques in Supervision," F. B. KNIGHT, *University of Iowa*

"An Attempt at Predicting Success in the Freshman Year at College," C. W. ODELL, *University of Illinois*

"Developments in the Floor Plans of School Buildings," B. F. PITTENGER, *University of Texas*

"Failures among University Freshmen," GROVER H. ALDERMAN, *Dean, School of Education, University of Pittsburgh*

"Measuring the Distinctive Effects of Teaching," S. A. COURTIS, *University of Michigan*

"The Problem of the Poorest Ten Percent of Freshmen," E. R. WOOD, *Director, Bureau of Educational Measurements and Standards, Kansas State Teachers College, Emporia*